SUPPLEMENTARY INFORMATION

The Effect of Meteorological Conditions and Atmospheric Composition in the Occurrence and Development of New Particle Formation (NPF) Events in Europe

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Table S1: Correlation matrices of the meteorological and atmospheric variables.

UKRU	SR	RH	T	WS	P	SO_2	NOx	O_3	OC	SO_4^{2-}	CS
SR	1.00	-0.70	0.55	0.12	0.13	0.05	-0.12	0.45	0.07	0.05	0.00
RH	-0.70	1.00	-0.55	-0.29	-0.10	-0.10	0.20	-0.59	0.01	-0.04	0.01
T	0.55	-0.55	1.00	0.12	0.09	-0.01	-0.26	0.37	0.15	0.11	-0.03
WS	0.12	-0.29	0.12	1.00	-0.42	0.04	-0.19	0.41	-0.29	-0.12	-0.32
P	0.13	-0.10	0.09	-0.42	1.00	-0.07	0.03	-0.09	0.13	0.15	0.23
SO_2	0.05	-0.10	-0.01	0.04	-0.07	1.00	0.05	0.06	0.03	0.37	0.31
NOx	-0.12	0.20	-0.26	-0.19	0.03	0.05	1.00	-0.58	0.48	0.16	0.54
O_3	0.45	-0.59	0.37	0.41	-0.09	0.06	-0.58	1.00	-0.30	-0.07	-0.34
OC	0.07	0.01	0.15	-0.29	0.13	0.03	0.48	-0.30	1.00	0.37	0.59
SO_4^{2-}	0.05	-0.04	0.11	-0.12	0.15	0.37	0.16	-0.07	0.37	1.00	0.44
CS	0.00	0.01	-0.03	-0.32	0.23	0.31	0.54	-0.34	0.59	0.44	1.00

UKUB	SR	RH	T	WS	P	SO_2	NOx	O_3	OC	SO_4^{2-}	CS
SR	1.00	-0.70	0.53	0.22	0.07	0.08	-0.15	0.47	0.01	0.02	-0.14
RH	-0.70	1.00	-0.56	-0.22	-0.19	-0.08	0.20	-0.66	-0.10	-0.01	0.08
T	0.53	-0.56	1.00	0.21	-0.05	-0.05	-0.38	0.52	-0.12	0.01	-0.18
WS	0.22	-0.22	0.21	1.00	-0.33	-0.16	-0.44	0.41	-0.43	-0.25	-0.50
P	0.07	-0.19	-0.05	-0.33	1.00	0.18	0.22	-0.06	0.31	0.25	0.26
SO_2	0.08	-0.08	-0.05	-0.16	0.18	1.00	0.44	-0.16	0.29	0.40	0.39
NOx	-0.15	0.20	-0.38	-0.44	0.22	0.44	1.00	-0.56	0.57	0.29	0.79
O_3	0.47	-0.66	0.52	0.41	-0.06	-0.16	-0.56	1.00	-0.14	-0.14	-0.40
OC	0.01	-0.10	-0.12	-0.43	0.31	0.29	0.57	-0.14	1.00	0.46	0.63
SO_4^{2-}	0.02	-0.01	0.01	-0.25	0.25	0.40	0.29	-0.14	0.46	1.00	0.36
CS	-0.14	0.08	-0.18	-0.50	0.26	0.39	0.79	-0.40	0.63	0.36	1.00

UKRO	SR	RH	T	WS	P	SO_2	NOx	O_3	OC	SO_4^{2-}	CS
SR	1.00	-0.68	0.51	0.11	0.15	0.14	0.17	0.16	-0.03	0.03	0.06
RH	-0.68	1.00	-0.49	-0.14	-0.24	0.01	-0.01	-0.35	0.09	-0.01	0.06
T	0.51	-0.49	1.00	0.16	0.21	0.18	0.15	-0.02	0.02	0.01	0.15
WS	0.11	-0.14	0.16	1.00	-0.34	0.17	0.17	0.08	-0.16	-0.19	-0.05
P	0.15	-0.24	0.21	-0.34	1.00	-0.10	-0.05	0.04	0.15	0.08	0.01
SO_2	0.14	0.01	0.18	0.17	-0.10	1.00	0.91	-0.65	0.36	-0.13	0.72
NOx	0.17	-0.01	0.15	0.17	-0.05	0.91	1.00	-0.63	0.34	-0.04	0.81
O_3	0.16	-0.35	-0.02	0.08	0.04	-0.65	-0.63	1.00	-0.43	0.02	-0.64
OC	-0.03	0.09	0.02	-0.16	0.15	0.36	0.34	-0.43	1.00	0.24	0.47
SO_4^{2-}	0.03	-0.01	0.01	-0.19	0.08	-0.13	-0.04	0.02	0.24	1.00	0.18
CS	0.06	0.06	0.15	-0.05	0.01	0.72	0.81	-0.64	0.47	0.18	1.00

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DENRU	SR	RH	T	WS	SO_2	NOx	O_3	OC	SO_4^{2-}	CS
SR	1.00	-0.56	0.44	0.07	-0.05	-0.12	0.43	-0.04	-0.09	0.05
RH	-0.56	1.00	-0.39	0.02	0.02	0.17	-0.54	0.01	0.18	-0.08
T	0.44	-0.39	1.00	-0.18	-0.09	-0.19	0.37	-0.13	-0.06	0.22
WS	0.07	0.02	-0.18	1.00	0.02	-0.28	0.22	-0.09	0.02	-0.32
SO_2	-0.05	0.02	-0.09	0.02	1.00	0.18	-0.06	0.48	0.51	0.34
NOx	-0.12	0.17	-0.19	-0.28	0.18	1.00	-0.58	0.34	0.22	0.54
O_3	0.43	-0.54	0.37	0.22	-0.06	-0.58	1.00	-0.17	-0.18	-0.17
OC	-0.04	0.01	-0.13	-0.09	0.48	0.34	-0.17	1.00	0.65	0.58
SO_4^{2-}	-0.09	0.18	-0.06	0.02	0.51	0.22	-0.18	0.65	1.00	0.41
CS	0.05	-0.08	0.22	-0.32	0.34	0.54	-0.17	0.58	0.41	1.00

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DENUB	SR	RH	T	WS	NOx	O_3	CS
SR	1.00	-0.55	0.45	0.06	-0.02	0.39	0.04
RH	-0.55	1.00	-0.40	-0.02	0.15	-0.58	-0.04
T	0.45	-0.40	1.00	-0.13	-0.11	0.40	0.18
WS	0.06	-0.02	-0.13	1.00	-0.37	0.26	-0.35
NOx	-0.02	0.15	-0.11	-0.37	1.00	-0.59	0.55
O_3	0.39	-0.58	0.40	0.26	-0.59	1.00	-0.23
CS	0.04	-0.04	0.18	-0.35	0.55	-0.23	1.00

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DENRO	SR	RH	T	WS	SO_2	NOx	O_3	OC	CS
SR	1.00	-0.55	0.30	0.21	0.37	0.29	0.41	0.00	0.26
RH	-0.55	1.00	-0.45	-0.09	-0.26	-0.17	-0.42	-0.20	-0.29
T	0.30	-0.45	1.00	0.04	0.22	0.12	0.25	0.39	0.41
WS	0.21	-0.09	0.04	1.00	-0.16	-0.12	0.53	-0.19	-0.12
SO_2	0.37	-0.26	0.22	-0.16	1.00	0.80	0.01	0.31	0.62
NOx	0.29	-0.17	0.12	-0.12	0.80	1.00	-0.02	0.20	0.67
O_3	0.41	-0.42	0.25	0.53	0.01	-0.02	1.00	-0.01	0.05
OC	0.00	-0.20	0.39	-0.19	0.31	0.20	-0.01	1.00	0.36
CS	0.26	-0.29	0.41	-0.12	0.62	0.67	0.05	0.36	1.00

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GERRU	SR	RH	T	WS	P	OC	SO_4^{2-}	CS
SR	1.00	-0.70	0.55	0.20	0.13	-0.07	-0.07	0.02
RH	-0.70	1.00	-0.61	-0.31	-0.12	0.08	0.10	-0.01
T	0.55	-0.61	1.00	0.01	0.11	-0.34	-0.29	-0.11
WS	0.20	-0.31	0.01	1.00	-0.24	-0.14	-0.09	-0.35
P	0.13	-0.12	0.11	-0.24	1.00	0.11	0.13	0.23
OC	-0.07	0.08	-0.34	-0.14	0.11	1.00	0.83	0.65
SO_4^{2-}	-0.07	0.10	-0.29	-0.09	0.13	0.83	1.00	0.52
CS	0.02	-0.01	-0.11	-0.35	0.23	0.65	0.52	1.00

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GERUB	SR	RH	T	WS	P	CS
SR	1.00	-0.72	0.55	0.25	0.16	-0.06
RH	-0.72	1.00	-0.61	-0.32	-0.17	0.10
T	0.55	-0.61	1.00	0.05	0.11	-0.20
WS	0.25	-0.32	0.05	1.00	-0.21	-0.31
P	0.16	-0.17	0.11	-0.21	1.00	0.21
CS	-0.06	0.10	-0.20	-0.31	0.21	1.00

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GERRO	SR	RH	T	WS	P	CS
SR	1.00	-0.65	0.50	0.19	0.14	0.05
RH	-0.65	1.00	-0.72	-0.14	-0.16	0.03
T	0.50	-0.72	1.00	-0.03	0.16	-0.14
WS	0.19	-0.14	-0.03	1.00	-0.15	-0.34
P	0.14	-0.16	0.16	-0.15	1.00	0.19
CS	0.05	0.03	-0.14	-0.34	0.19	1.00

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FINRU	SR	RH	T	WS	P	SO_2	NOx	O_3	OC	SO_4^{2-}	CS
SR	1.00	-0.67	0.50	0.11	0.11	0.00	-0.24	0.30	-0.05	-0.14	0.09
RH	-0.67	1.00	-0.56	-0.21	-0.27	-0.12	0.31	-0.55	0.00	0.17	-0.20
T	0.50	-0.56	1.00	0.01	0.03	-0.20	-0.28	-0.14	0.27	-0.20	0.28
WS	0.11	-0.21	0.01	1.00	0.17	0.11	0.13	0.35	-0.20	-0.20	-0.07
P	0.11	-0.27	0.03	0.17	1.00	0.00	-0.08	-0.08	0.34	0.12	0.19
SO_2	0.00	-0.12	-0.20	0.11	0.00	1.00	0.18	0.09	NA	NA	0.21
NOx	-0.24	0.31	-0.28	0.13	-0.08	0.18	1.00	-0.24	NA	NA	0.12
O_3	0.30	-0.55	-0.14	0.35	-0.08	0.09	-0.24	1.00	NA	NA	0.02
OC	-0.05	0.00	0.27	-0.20	0.34	NA	NA	NA	1.00	0.43	0.61
SO_4^{2-}	-0.14	0.17	-0.20	-0.20	0.12	NA	NA	NA	0.43	1.00	0.18
CS	0.09	-0.20	0.28	-0.07	0.19	0.21	0.12	0.02	0.61	0.18	1.00

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FINUB	SR	RH	T	WS	P	CS
SR	1.00	-0.54	0.45	0.05	0.09	0.00
RH	-0.54	1.00	-0.35	0.04	-0.23	-0.01
T	0.45	-0.35	1.00	-0.02	-0.01	0.00
WS	0.05	0.04	-0.02	1.00	-0.26	0.00
P	0.09	-0.23	-0.01	-0.26	1.00	0.00
CS	0.00	-0.01	0.00	0.00	0.00	1.00

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FINRO	SR	RH	T	WS	P	SO_2	NOx	O_3	CS
SR	1.00	-0.58	0.47	0.03	0.08	0.09	0.05	0.20	0.09
RH	-0.58	1.00	-0.29	-0.05	-0.24	-0.05	0.02	-0.34	0.01
T	0.47	-0.29	1.00	-0.07	-0.02	-0.09	-0.08	0.18	0.05
WS	0.03	-0.05	-0.07	1.00	-0.25	0.01	-0.29	0.41	-0.32
P	0.08	-0.24	-0.02	-0.25	1.00	0.08	0.10	-0.09	0.13
SO_2	0.09	-0.05	-0.09	0.01	0.08	1.00	0.08	0.00	0.07
NOx	0.05	0.02	-0.08	-0.29	0.10	0.08	1.00	-0.61	0.75
O_3	0.20	-0.34	0.18	0.41	-0.09	0.00	-0.61	1.00	-0.51
CS	0.09	0.01	0.05	-0.32	0.13	0.07	0.75	-0.51	1.00

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SPARU	SR	RH	T	WS	P	SO_2	NO2	O_3	CS
SR	1.00	-0.45	0.50	0.38	0.09	0.10	-0.02	0.34	0.34
RH	-0.45	1.00	-0.29	-0.20	-0.24	-0.08	0.05	-0.48	-0.06
T	0.50	-0.29	1.00	0.16	0.24	0.07	-0.05	0.54	0.47
WS	0.38	-0.20	0.16	1.00	-0.16	0.13	-0.02	0.25	0.10
P	0.09	-0.24	0.24	-0.16	1.00	-0.15	0.12	0.09	0.14
SO_2	0.10	-0.08	0.07	0.13	-0.15	1.00	0.14	0.19	0.25
NO_2	-0.02	0.05	-0.05	-0.02	0.12	0.14	1.00	-0.02	0.42
O_3	0.34	-0.48	0.54	0.25	0.09	0.19	-0.02	1.00	0.44
CS	0.34	-0.06	0.47	0.10	0.14	0.25	0.42	0.44	1.00

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SPAUB	SR	RH	T	WS	P	SO_2	NO2	O_3	CS
SR	1.00	-0.43	0.44	0.18	0.03	0.25	-0.09	0.32	0.00
RH	-0.43	1.00	-0.04	-0.23	-0.16	-0.12	0.10	-0.23	0.16
T	0.44	-0.04	1.00	-0.14	0.11	0.35	-0.07	0.38	0.11
WS	0.18	-0.23	-0.14	1.00	-0.26	-0.08	-0.34	0.32	-0.43
P	0.03	-0.16	0.11	-0.26	1.00	0.13	0.15	-0.10	0.10
SO_2	0.25	-0.12	0.35	-0.08	0.13	1.00	0.20	0.13	0.16
NO_2	-0.09	0.10	-0.07	-0.34	0.15	0.20	1.00	-0.66	0.59
O_3	0.32	-0.23	0.38	0.32	-0.10	0.13	-0.66	1.00	-0.35
CS	0.00	0.16	0.11	-0.43	0.10	0.16	0.59	-0.35	1.00

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GRERU	SR	RH	T	WS	P	NO_2	O_3	OC	CS
SR	1.00	-0.30	0.33	0.02	-0.11	0.36	0.19	0.09	0.18
RH	-0.30	1.00	-0.25	-0.27	0.20	-0.20	-0.12	-0.06	0.08
T	0.33	-0.25	1.00	0.00	-0.53	0.02	0.54	0.35	0.46
WS	0.02	-0.27	0.00	1.00	-0.21	-0.03	0.15	0.14	0.11
P	-0.11	0.20	-0.53	-0.21	1.00	-0.10	-0.35	-0.24	-0.09
NO_2	0.36	-0.20	0.02	-0.03	-0.10	1.00	0.00	0.01	-0.02
O_3	0.19	-0.12	0.54	0.15	-0.35	0.00	1.00	0.50	0.62
OC	0.09	-0.06	0.35	0.14	-0.24	0.01	0.50	1.00	0.47
CS	0.18	0.08	0.46	0.11	-0.09	-0.02	0.62	0.47	1.00

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GREUB	SR	RH	T	WS	P	CS
SR	1.00	-0.55	0.48	0.47	-0.15	0.04
RH	-0.55	1.00	-0.67	-0.30	0.18	-0.07
T	0.48	-0.67	1.00	0.20	-0.51	-0.06
WS	0.47	-0.30	0.20	1.00	-0.15	-0.21
P	-0.15	0.18	-0.51	-0.15	1.00	0.16
CS	0.04	-0.07	-0.06	-0.21	0.16	1.00

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Table S2: Slopes and R^2 for the relation between VOCs and NPF event variables.

UKRU	a_N	R^2	a_{GR}	R^2	a_J	R^2
benzene	-3.37E-01	0.88	1.24E+00	0.16	-5.99E-03	0.07
ethane	-5.42E-02	0.88	-4.79E-01	0.26	-4.61E-03	0.77
ethene	-1.65E-01	0.83	2.64E+00	0.60	-1.70E-02	0.57
ethylbenzene	-7.01E-01	0.79	6.78E+00	0.41	-5.77E-02	0.63
iso.butane	-2.06E-01	0.75	1.41E+00	0.70	-5.62E-03	0.11
iso.octane	-5.23E-01	0.45	1.09E+01	0.80	9.32E-03	0.11
iso.pentane	-1.96E-01	0.74	2.36E+00	0.58	2.36E-02	0.72
m.p.xylene	-2.92E-01	0.86	3.21E+00	0.68	-1.98E-02	0.35
n.butane	-1.67E-01	0.79	1.04E+00	0.44	1.43E-02	0.11
n.heptane	-9.63E-01	0.80	1.36E+01	0.73	-1.46E-02	0.13
n.hexane	-1.21E+00	0.84	6.82E+00	0.67	1.33E-02	0.11
n.pentane	-3.71E-01	0.67	3.49E+00	0.64	-8.97E-03	0.06
o.xylene	-5.34E-01	0.71	8.59E+00	0.86	-1.81E-02	0.42
propane	-7.77E-02	0.76	1.97E-01	0.24	-4.28E-03	0.49
propene	-1.50E-01	0.67	-4.01E-01	0.02	6.20E-03	0.08
toluene	-1.48E-01	0.79	1.88E+00	0.81	-9.26E-03	0.43
1.2.4.trimethylbenzene	-4.36E-01	0.46	5.38E+00	0.29	-4.78E-02	0.68
1.3.butadiene	-1.17E+00	0.40	-1.68E+01	0.71	-7.55E-02	0.66
1.butene	-9.39E-02	0.03	-4.77E+00	0.25	-1.99E-02	0.07
2.methylpentane	-7.66E-01	0.77	8.49E+00	0.57	4.56E-02	0.64

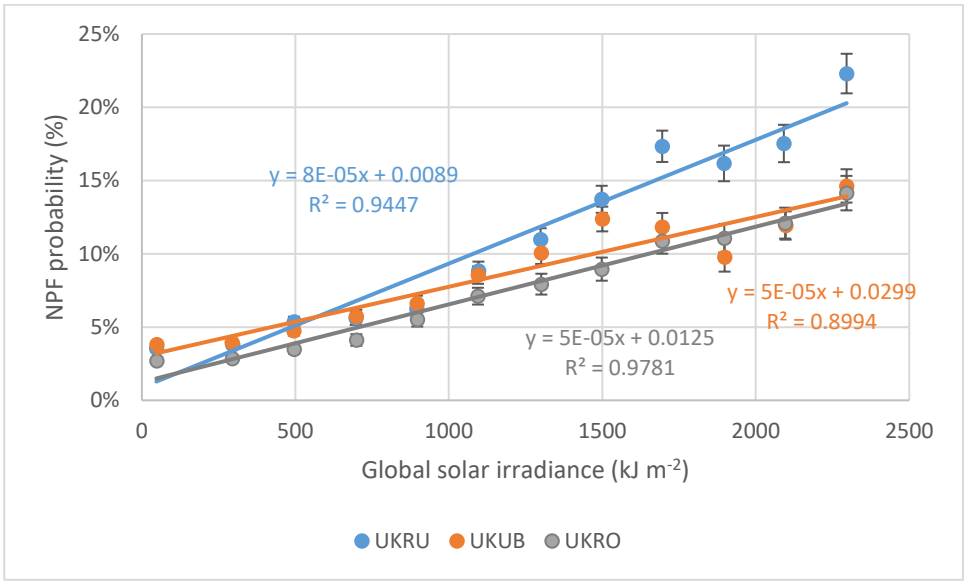
FINRU	a_N	R^2	a_{GR}	R^2	a_J	R^2
Acetaldehyde	-1.04E-01	0.05	-2.16E+00	0.69	1.23E-02	0.07
Aceticacid	1.19E-01	0.13	5.88E+00	0.77	3.33E-02	0.21
Acetolnitrite	-1.02E+00	0.13	1.33E+01	0.59	6.62E-02	0.18
Acetone	-4.63E-02	0.08	3.38E+00	0.74	5.85E-03	0.19
Benzene	-4.46E-01	0.11	-2.02E+01	0.83	-4.13E-02	0.02
Ethanol	4.04E-02	0.06	1.31E+00	0.10	4.77E-03	0.10
Isoprene	-3.17E+00	0.51	1.59E+01	0.87	-1.50E+00	0.31
MEK	6.45E-01	0.34	-8.03E+00	0.36	2.95E-02	0.03
Methacrolein.MVK	-5.15E+00	0.45	3.75E+01	0.66	2.92E-02	0.02

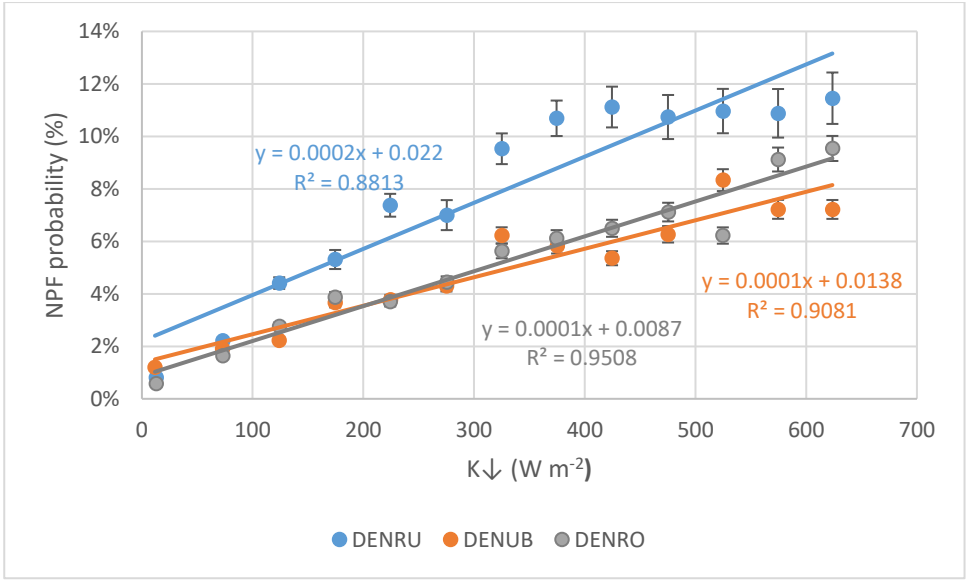
Methanol	1.68E-02	0.05	1.48E+00	0.75	3.48E-03	0.12
Monoterpenes	-1.17E-01	0.38	2.84E+00	0.56	1.11E-03	0.00
Toluene	-4.25E+00	0.59	2.88E+01	0.80	-5.55E-02	0.13

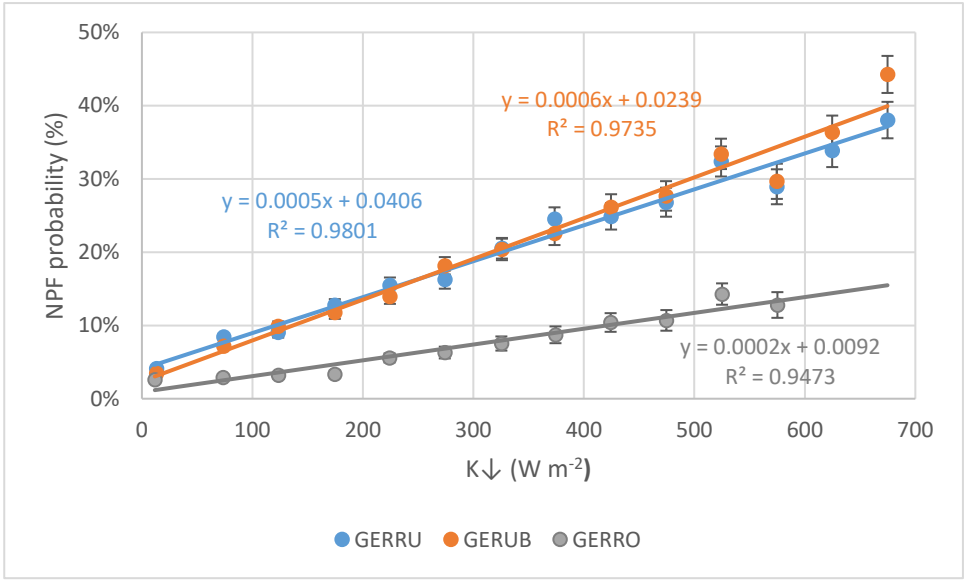
UKRO	a_N	R^2	a_{GR}	R^2	a_J	R^2
benzene	-1.03E-01	0.68	1.36E+00	0.80	4.42E-02	0.78
cis.2.butene	-1.93E-01	0.59	8.33E-01	0.02	1.70E-01	0.48
ethane	-2.45E-02	0.53	2.99E-02	0.06	2.28E-03	0.14
ethene	-4.59E-02	0.69	5.74E-01	0.83	2.50E-02	0.97
ethylbenzene	-7.13E-02	0.87	1.22E+00	0.77	3.59E-02	0.41
ethyne	-8.43E-02	0.74	1.23E+00	0.75	4.22E-02	0.64
iso.butane	-4.70E-02	0.55	6.07E-01	0.78	1.79E-02	0.92
iso.octane	-7.53E-02	0.80	2.14E+00	0.78	7.35E-02	0.67
iso.pentane	-1.10E-02	0.70	2.64E-01	0.72	1.00E-02	0.82
isoprene	-2.75E-02	0.07	4.34E-01	0.01	2.24E-03	0.00
m.p.xylene	-1.99E-02	0.91	3.81E-01	0.56	1.47E-02	0.64
n.butane	-2.17E-02	0.61	2.58E-01	0.78	4.07E-03	0.17
n.heptane	-1.53E-01	0.75	2.51E+00	0.80	1.15E-01	0.82
n.hexane	-1.10E-01	0.63	2.86E+00	0.75	8.28E-02	0.74
n.octane	-2.64E-01	0.55	7.06E+00	0.72	2.73E-01	0.98
n.pentane	-5.44E-02	0.53	1.03E+00	0.80	2.99E-02	0.86
o.xylene	-4.69E-02	0.88	9.58E-01	0.65	4.37E-02	0.86
propane	-3.16E-02	0.68	1.95E-01	0.32	1.01E-02	0.90
propene	-6.69E-02	0.87	1.15E+00	0.85	3.55E-02	0.78
toluene	-1.22E-02	0.84	2.76E-01	0.74	1.15E-02	0.85
trans.2.butene	-2.63E-01	0.72	3.16E+00	0.35	1.41E-01	0.60
trans.2.pentene	-1.67E-01	0.73	2.69E+00	0.31	1.16E-01	0.52
1.2.3.trimethylbenzene	-1.45E-01	0.78	3.31E+00	0.66	1.28E-01	0.81
1.2.4.trimethylbenzene	-4.89E-02	0.85	7.64E-01	0.43	3.26E-02	0.46
1.3.5.trimethylbenzene	-8.62E-02	0.77	1.56E+00	0.67	6.65E-02	0.64
1.3.butadiene	-1.78E-01	0.81	2.99E+00	0.44	9.04E-02	0.26
1.butene	-2.18E-01	0.38	2.51E+00	0.25	1.24E-01	0.64
1.pentene	-2.43E-01	0.52	6.92E+00	0.37	3.00E-01	0.82
2.methylpentane	-3.73E-02	0.68	8.57E-01	0.67	2.83E-02	0.80

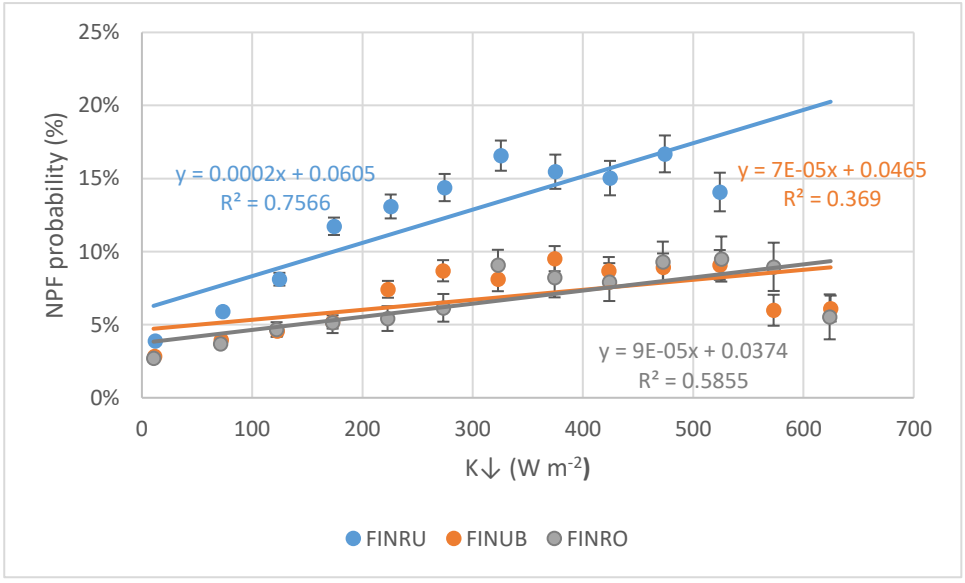
39

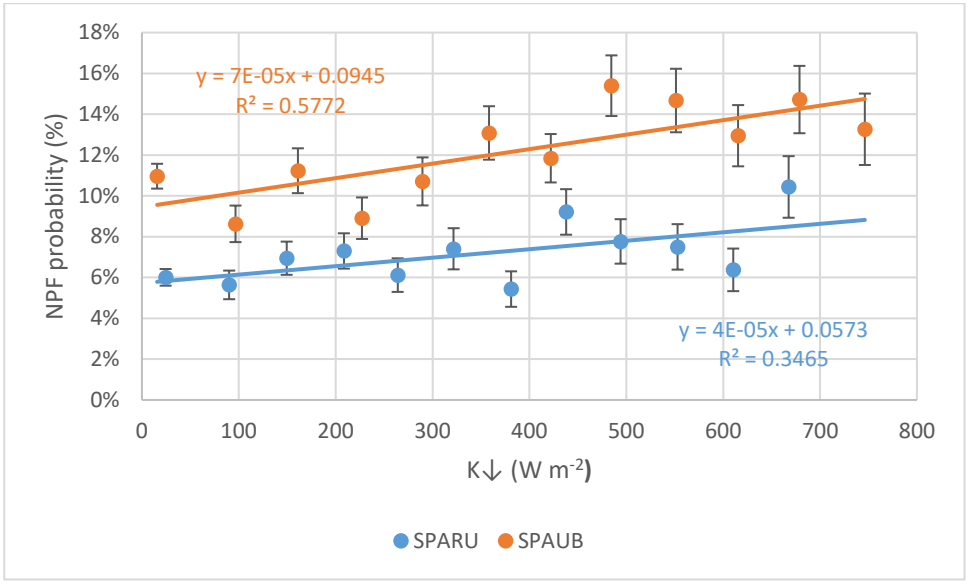
Figure S1: Relation of meteorological and atmospheric variables with NPF variables for all sites of the present study.

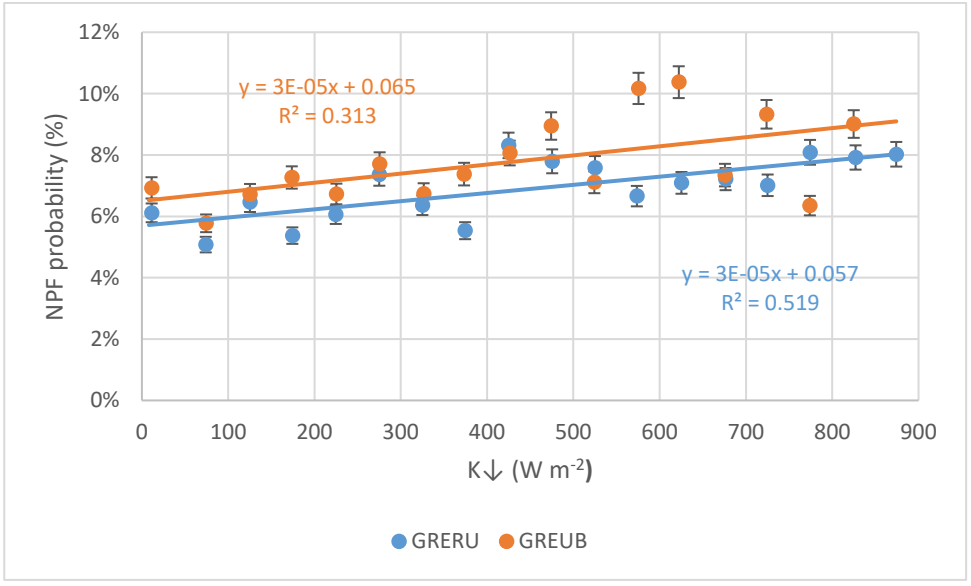


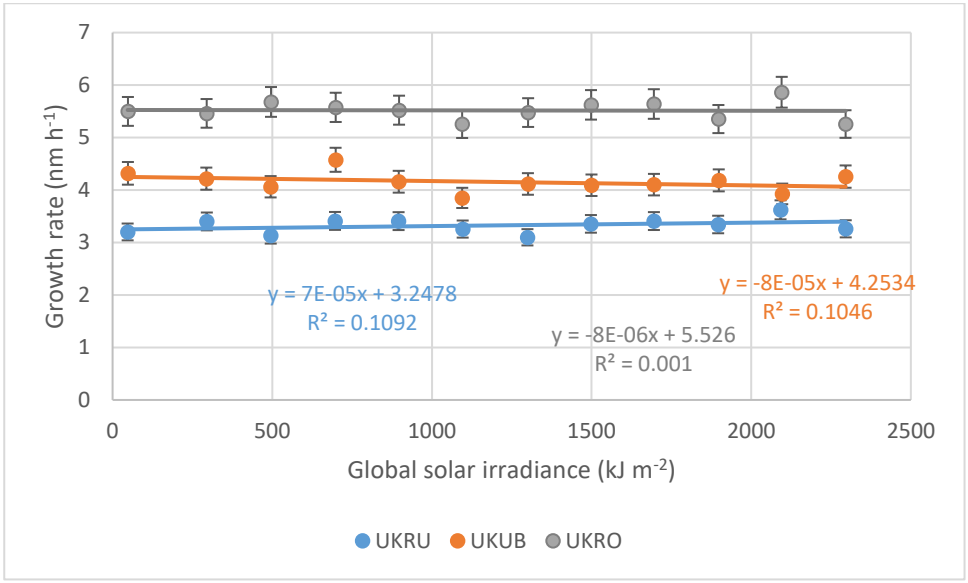



50%
40%
30%
20%
10%
0%
NPF probability (%)
y = 0.0006x + 0.0239
R² = 0.9735
y = 0.0005x + 0.0406
R² = 0.9801
y = 0.0002x + 0.0092
R² = 0.9473
0
100
200
300
400
500
600
700
K↓ (W m-2)
GERRU
GERUB
GERRO


25%
20%
15%
10%
5%
0%
NPF probability (%)
y = 0.0002x + 0.0605
R² = 0.7566
y = 7E-05x + 0.0465
R² = 0.369
y = 9E-05x + 0.0374
R² = 0.5855
0
100
200
300
400
500
600
700
K↓ (W m-2)
FINRU
FINUB
FINRO

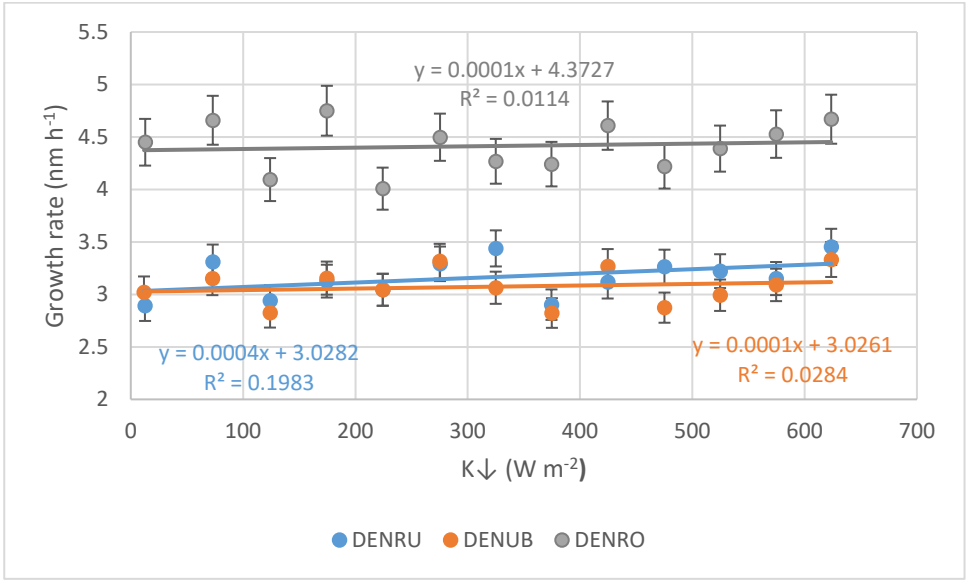

y = 7E-05x + 0.0945
R² = 0.5772
y = 4E-05x + 0.0573
R² = 0.3465
NPF probability (%)
K↓ (W m-2)
SPARU
SPAUB


y = 3E-05x + 0.065
R² = 0.313
y = 3E-05x + 0.057
R² = 0.519
NPF probability (%)
K↓ (W m-2)
GRERU
GREUB



64

65

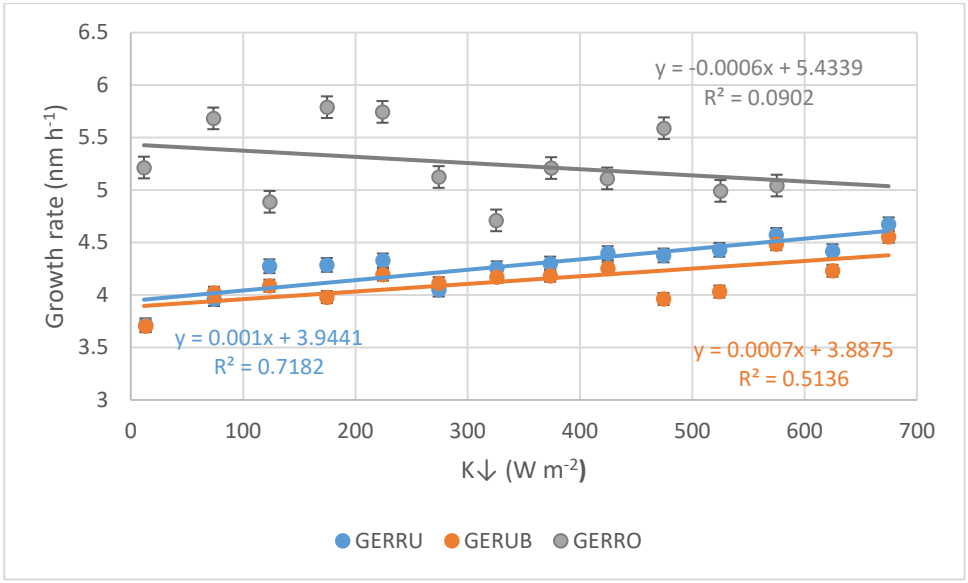


66

67

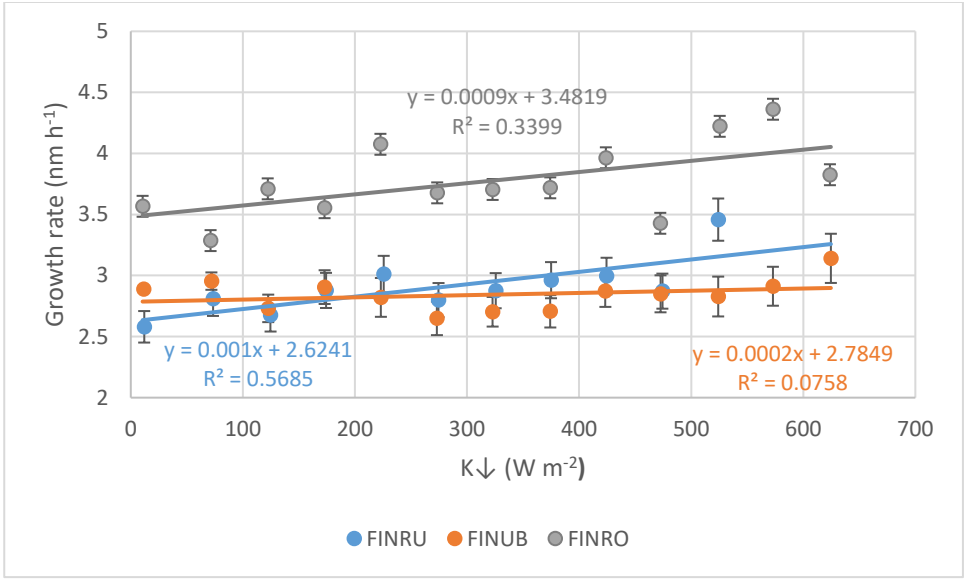
68

69


y = -0.0006x + 5.4339
R² = 0.0902
y = 0.001x + 3.9441
R² = 0.7182
y = 0.0007x + 3.8875
R² = 0.5136
Growth rate (nm h-1)
K↓ (W m-2)
GERRU
GERUB
GERRO

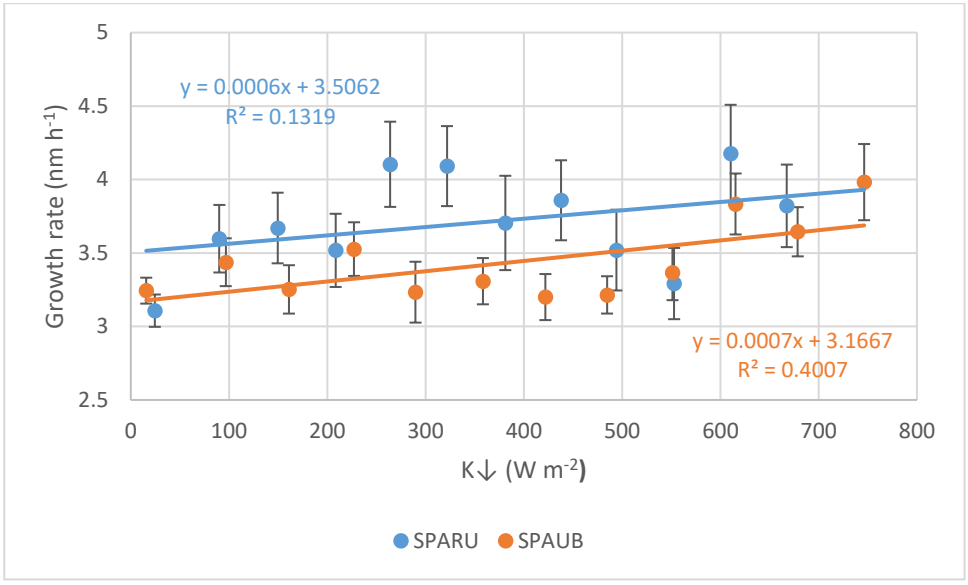
70

71


y = 0.0009x + 3.4819
R² = 0.3399
y = 0.001x + 2.6241
R² = 0.5685
y = 0.0002x + 2.7849
R² = 0.0758
Growth rate (nm h-1)
K↓ (W m-2)
FINRU
FINUB
FINRO

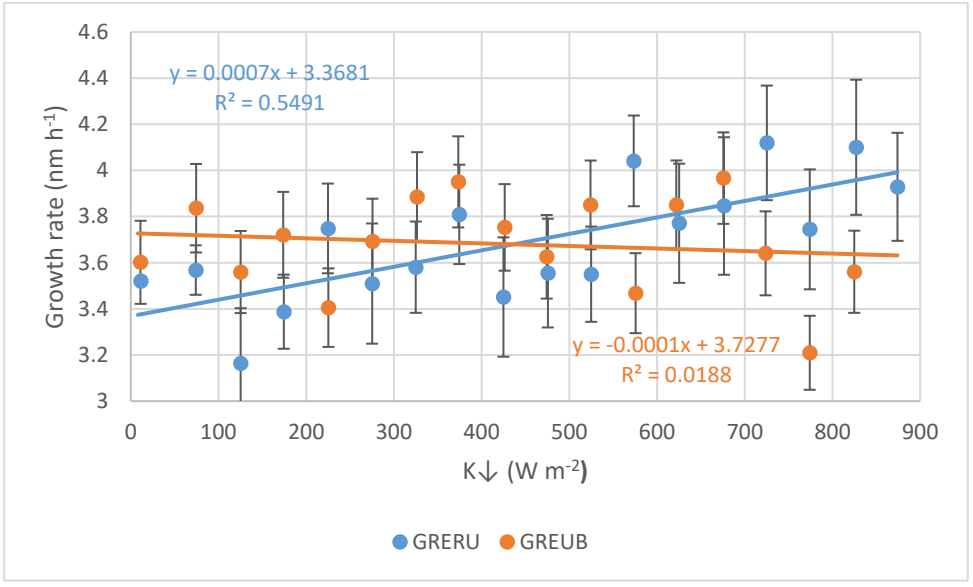
72

73


y = 0.0006x + 3.5062
R² = 0.1319
y = 0.0007x + 3.1667
R² = 0.4007
Growth rate (nm h-1)
K↓ (W m-2)
SPARU
SPAUB

74

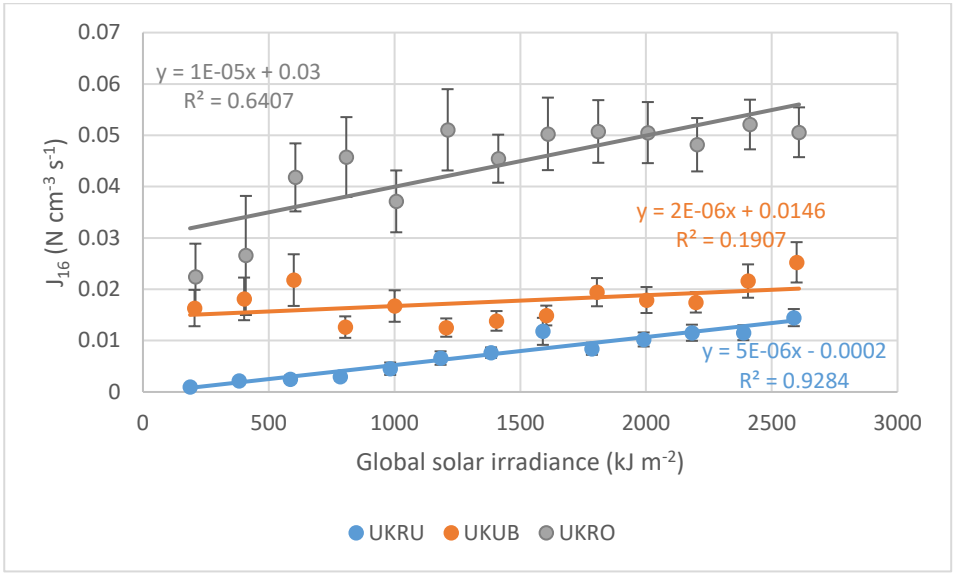
75


y = 0.0007x + 3.3681
R² = 0.5491
y = -0.0001x + 3.7277
R² = 0.0188
Growth rate (nm h-1)
K↓ (W m-2)
GRERU
GREUB

76

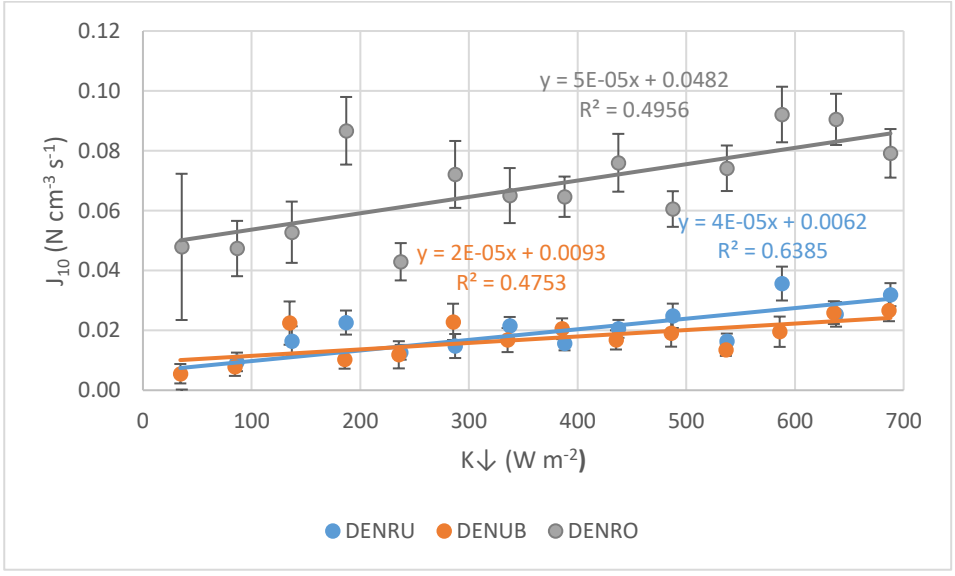
77

78


y = 1E-05x + 0.03
R² = 0.6407
y = 2E-06x + 0.0146
R² = 0.1907
y = 5E-06x - 0.0002
R² = 0.9284
J16 (N cm-3 s-1)
Global solar irradiance (kJ m-2)
UKRU
UKUB
UKRO

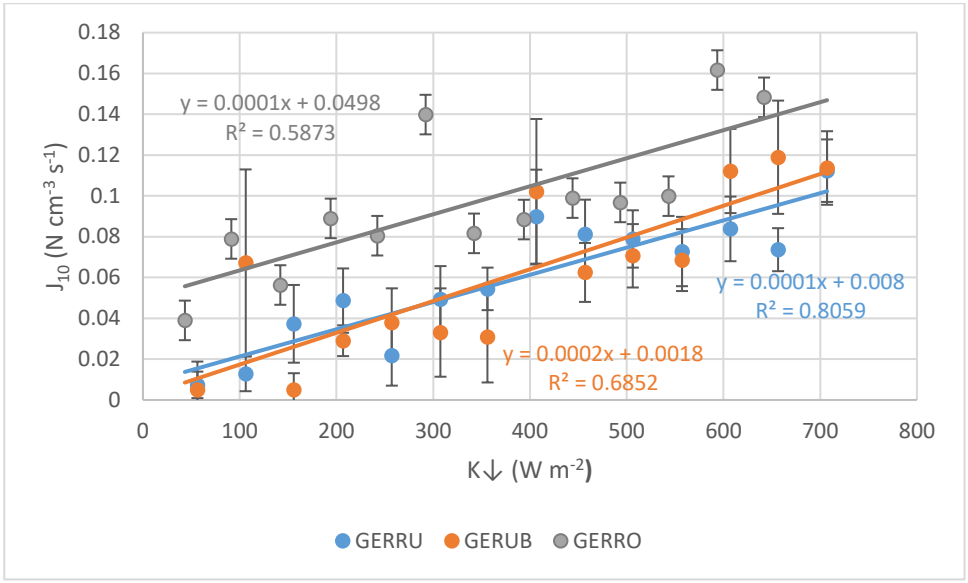
79

80


y = 5E-05x + 0.0482
R² = 0.4956
y = 4E-05x + 0.0062
R² = 0.6385
y = 2E-05x + 0.0093
R² = 0.4753
J10 (N cm-3 s-1)
K↓ (W m-2)
DENRU
DENUB
DENRO

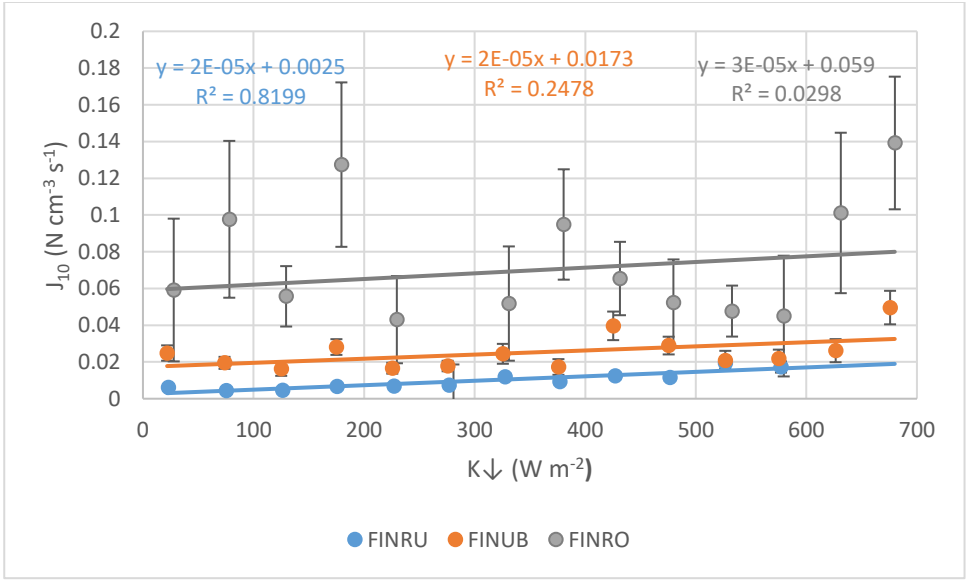
81

82


y = 0.0001x + 0.0498
R² = 0.5873
y = 0.0001x + 0.008
R² = 0.8059
y = 0.0002x + 0.0018
R² = 0.6852
J10 (N cm-3 s-1)
K↓ (W m-2)
GERRU
GERUB
GERRO

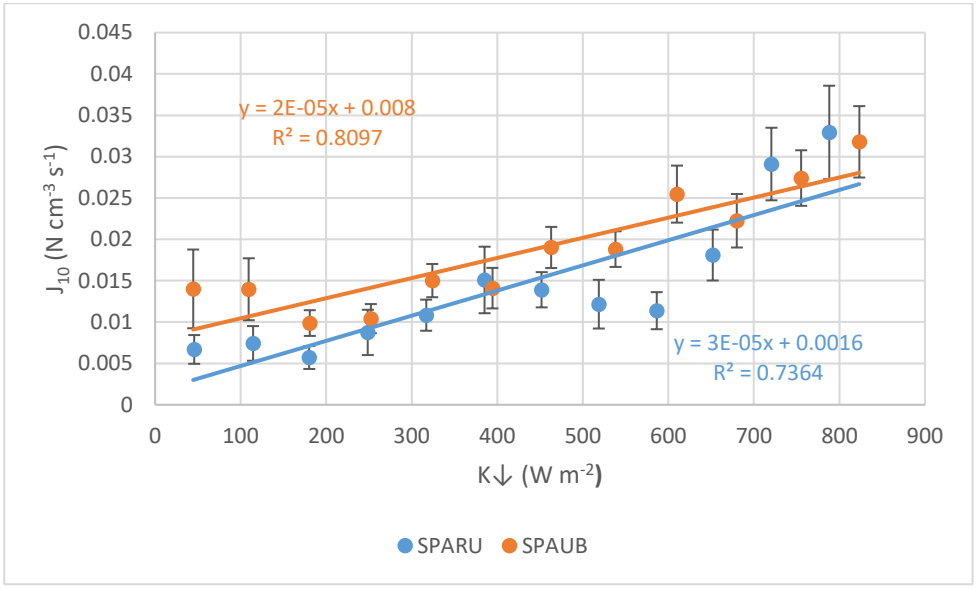
83

84


y = 2E-05x + 0.0025
R² = 0.8199
y = 2E-05x + 0.0173
R² = 0.2478
y = 3E-05x + 0.059
R² = 0.0298
J10 (N cm-3 s-1)
K↓ (W m-2)
FINRU
FINUB
FINRO

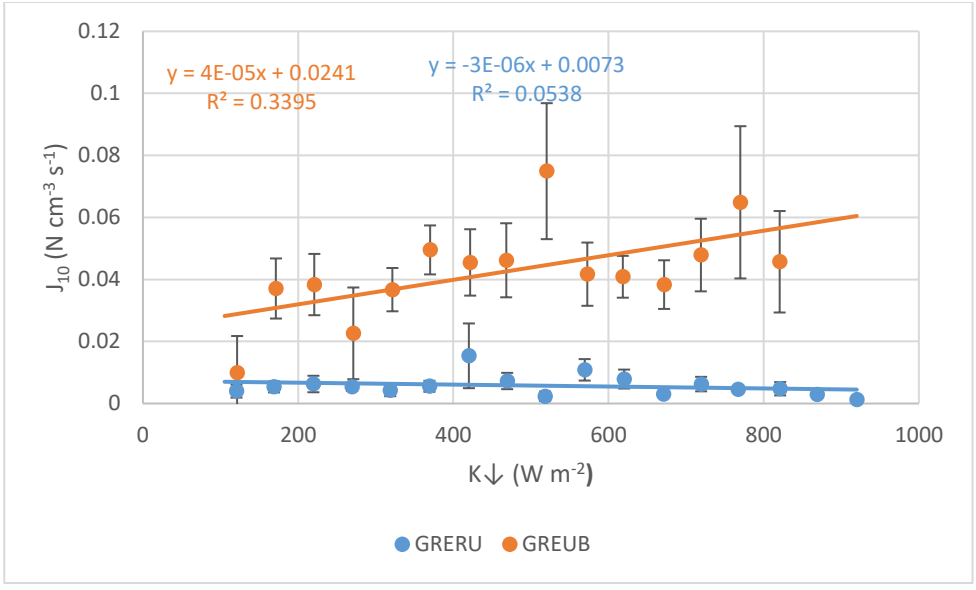
85

86


0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
y = 2E-05x + 0.008
R² = 0.8097
y = 3E-05x + 0.0016
R² = 0.7364
J10 (N cm-3 s-1)
0
100
200
300
400
500
600
700
800
900
K↓ (W m-2)
SPARU
SPAUB

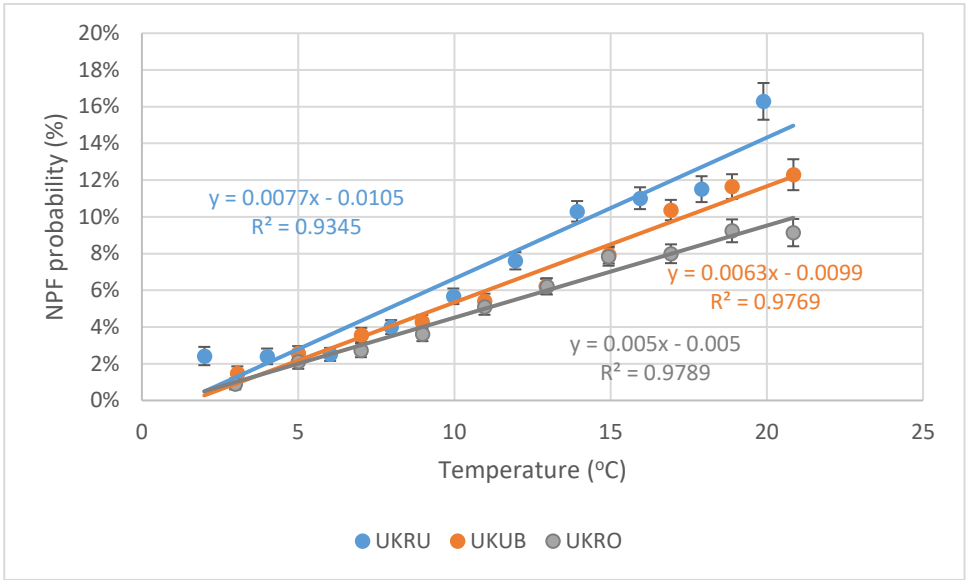
87

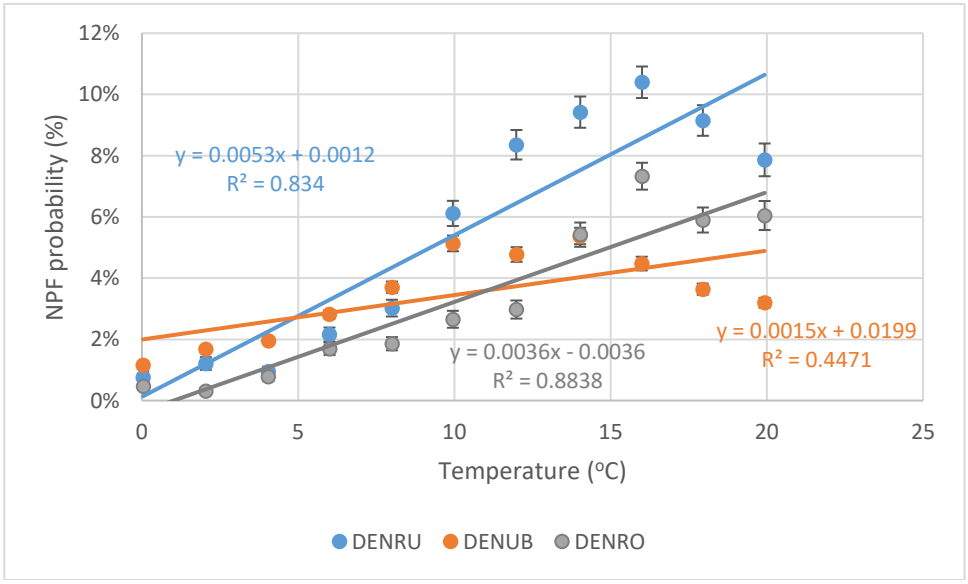
88

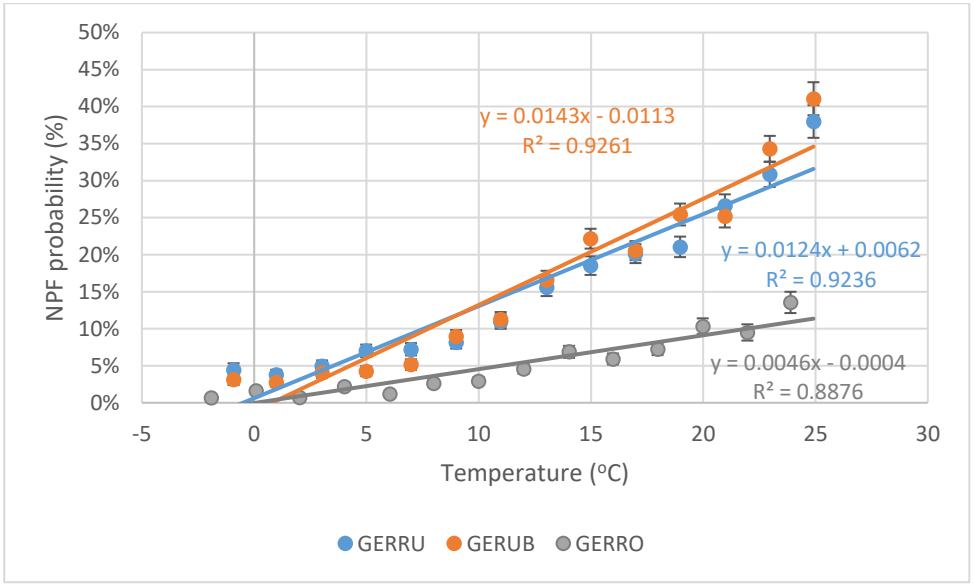

0.12
0.1
0.08
0.06
0.04
0.02
0
y = 4E-05x + 0.0241
R² = 0.3395
y = -3E-06x + 0.0073
R² = 0.0538
J10 (N cm-3 s-1)
0
200
400
600
800
1000
K↓ (W m-2)
GRERU
GREUB

89

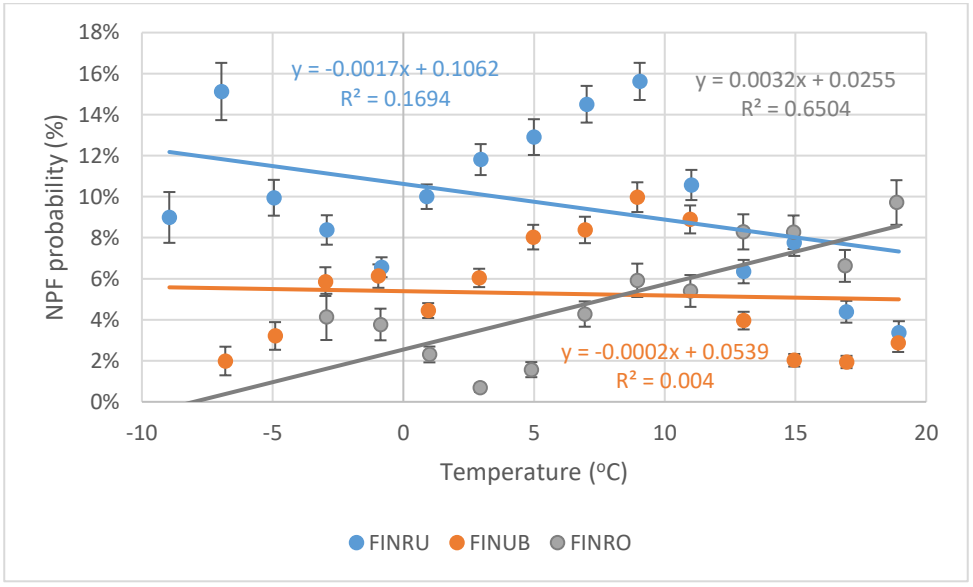
90


20%
18%
16%
14%
12%
10%
8%
6%
4%
2%
0%
NPF probability (%)
y = 0.0077x - 0.0105
R² = 0.9345
y = 0.0063x - 0.0099
R² = 0.9769
y = 0.005x - 0.005
R² = 0.9789
0
5
10
15
20
25
Temperature (°C)
UKRU
UKUB
UKRO

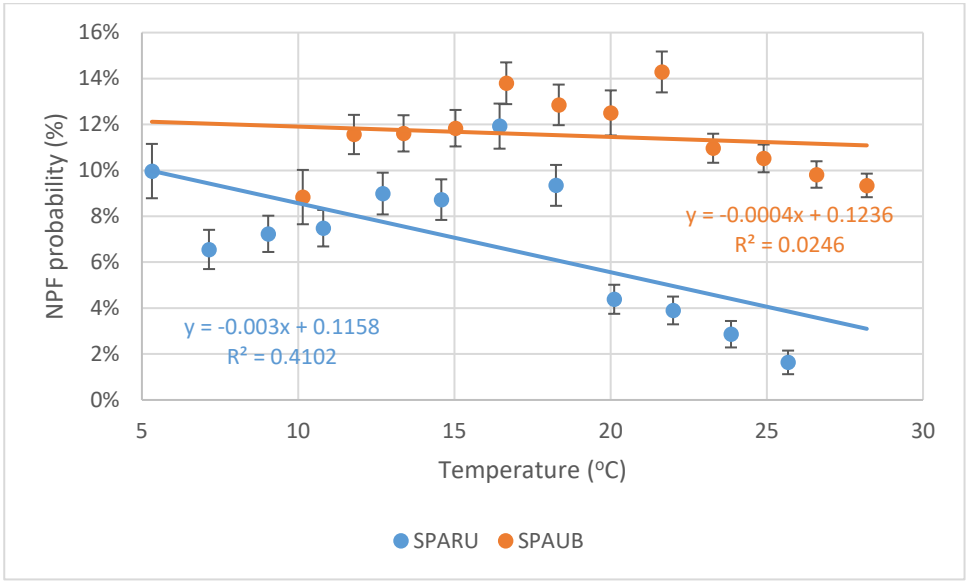

12%
10%
8%
6%
4%
2%
0%
NPF probability (%)
y = 0.0053x + 0.0012
R² = 0.834
y = 0.0036x - 0.0036
R² = 0.8838
y = 0.0015x + 0.0199
R² = 0.4471
0
5
10
15
20
25
Temperature (°C)
DENRU
DENUB
DENRO

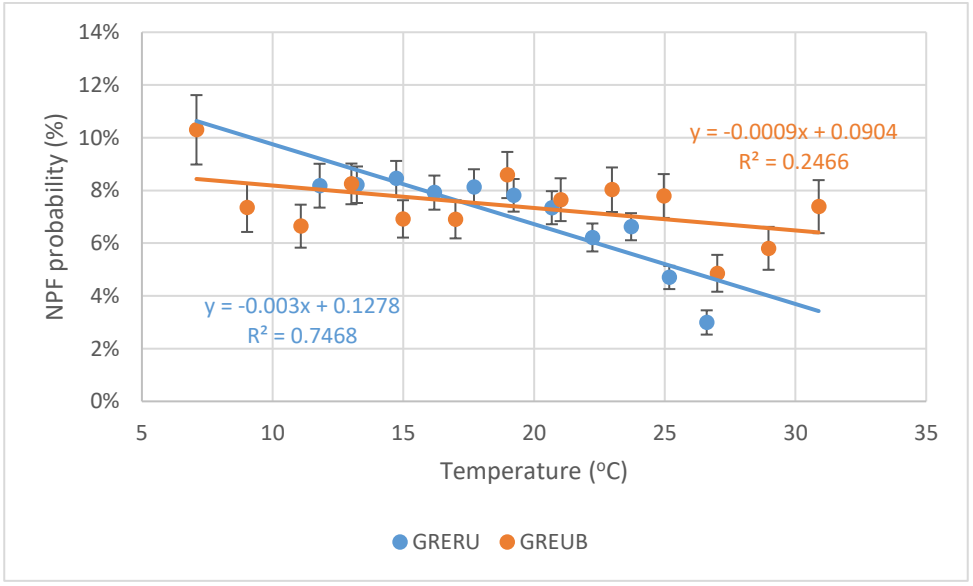


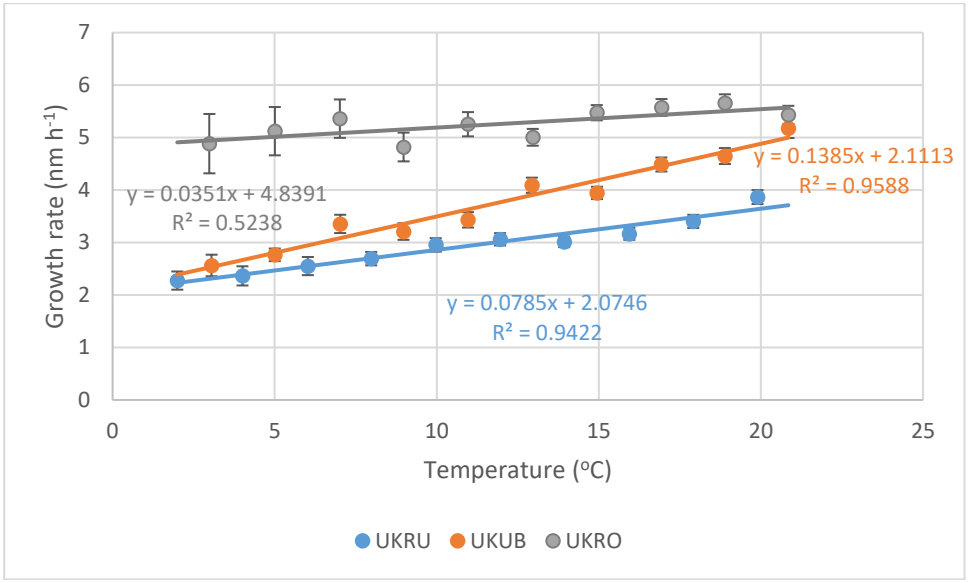
101
102

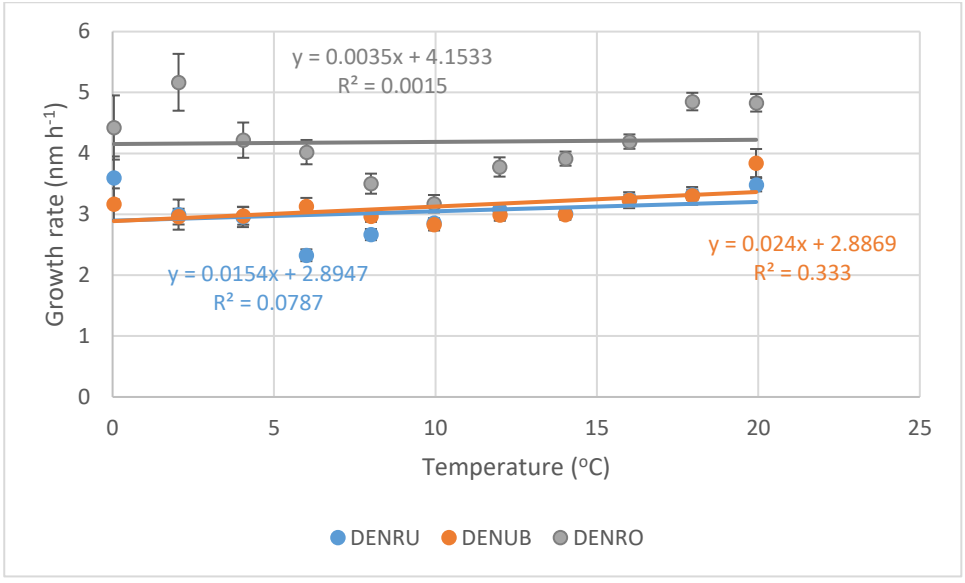


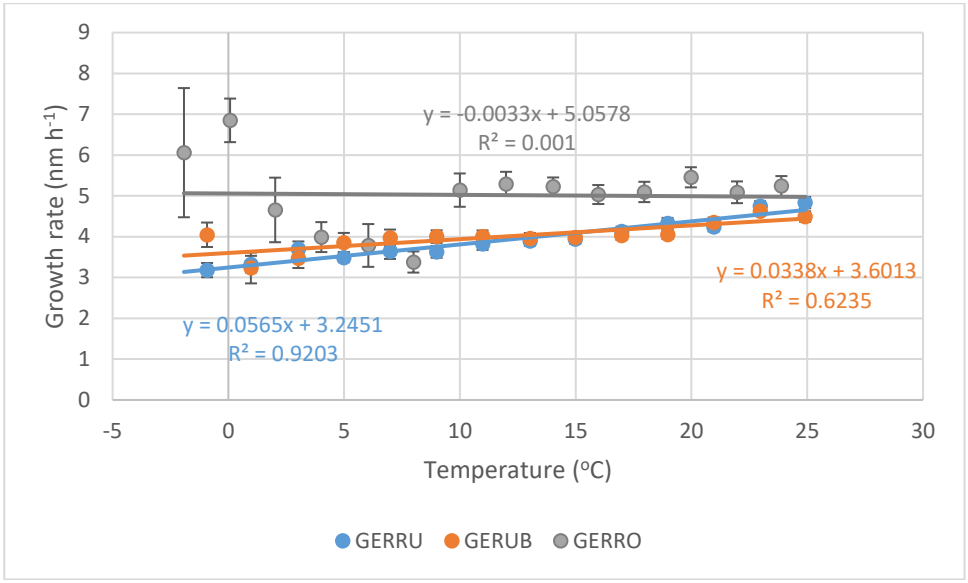
103
104
105
106
107

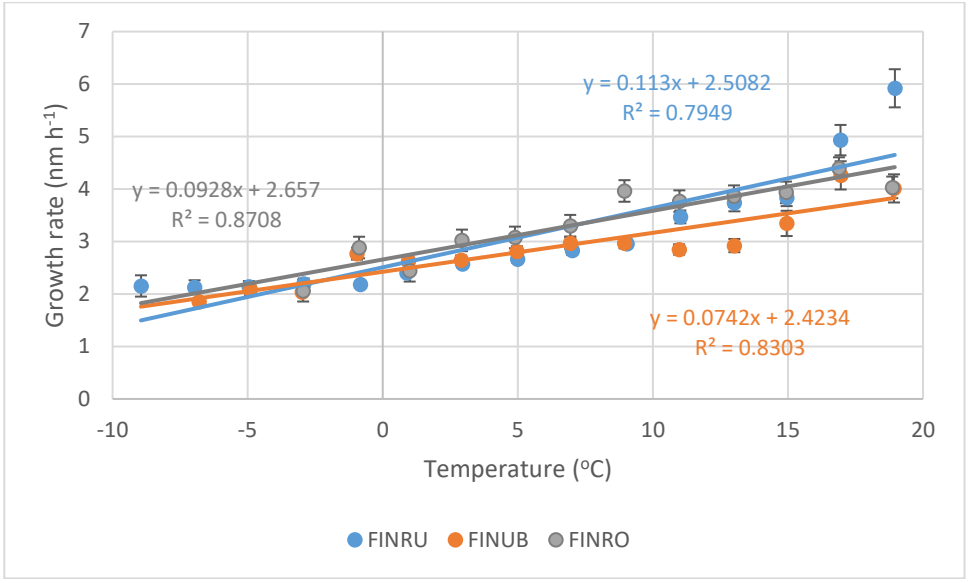

16%
14%
12%
10%
8%
6%
4%
2%
0%
NPF probability (%)
5
10
15
20
25
30
Temperature (°C)
y = -0.003x + 0.1158
R² = 0.4102
y = -0.0004x + 0.1236
R² = 0.0246
SPARU
SPAUB

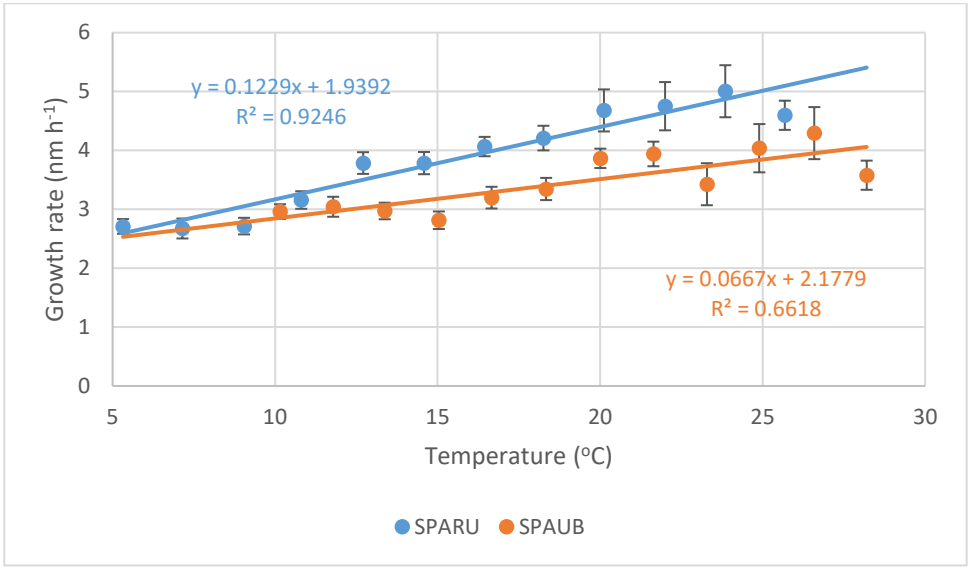

14%
12%
10%
8%
6%
4%
2%
0%
NPF probability (%)
5
10
15
20
25
30
35
Temperature (°C)
y = -0.0009x + 0.0904
R² = 0.2466
y = -0.003x + 0.1278
R² = 0.7468
GRERU
GREUB


Growth rate (nm h-1)
Temperature (°C)
y = 0.0351x + 4.8391
R² = 0.5238
y = 0.1385x + 2.1113
R² = 0.9588
y = 0.0785x + 2.0746
R² = 0.9422
UKRU
UKUB
UKRO

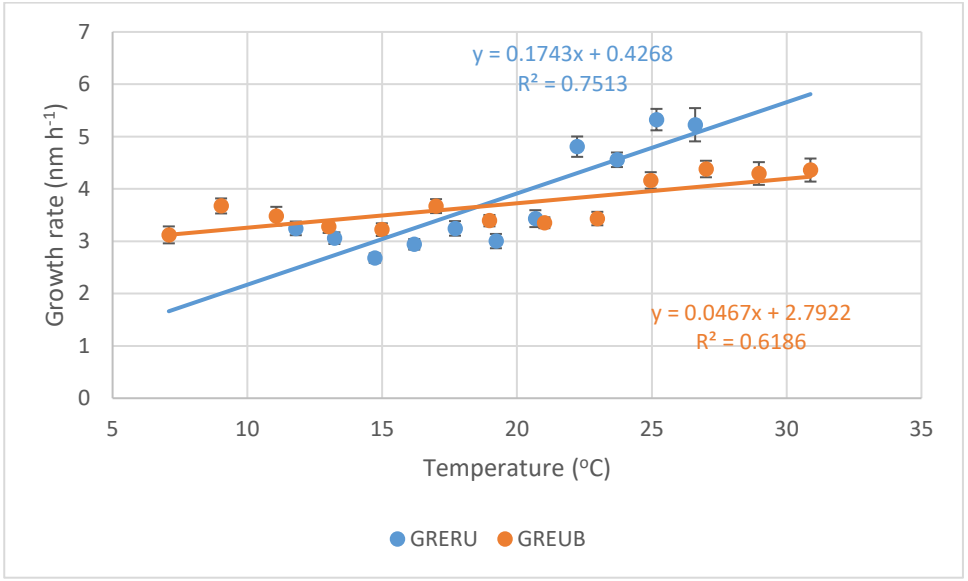

Growth rate (nm h-1)
Temperature (°C)
y = 0.0035x + 4.1533
R² = 0.0015
y = 0.0154x + 2.8947
R² = 0.0787
y = 0.024x + 2.8869
R² = 0.333
DENRU
DENUB
DENRO


Growth rate (nm h-1)
Temperature (ºC)
y = -0.0033x + 5.0578
R² = 0.001
y = 0.0338x + 3.6013
R² = 0.6235
y = 0.0565x + 3.2451
R² = 0.9203
GERRU
GERUB
GERRO

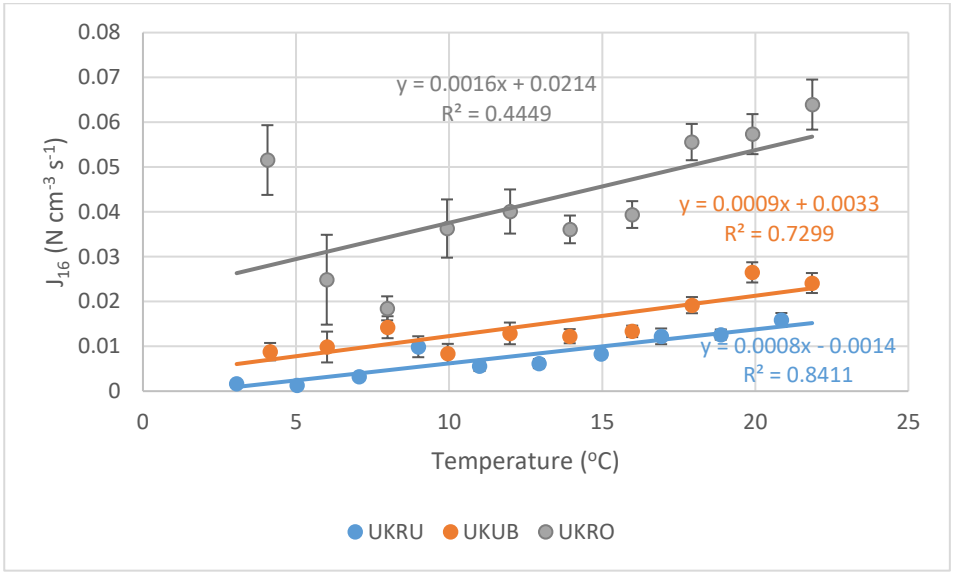

Growth rate (nm h-1)
Temperature (ºC)
y = 0.113x + 2.5082
R² = 0.7949
y = 0.0928x + 2.657
R² = 0.8708
y = 0.0742x + 2.4234
R² = 0.8303
FINRU
FINUB
FINRO



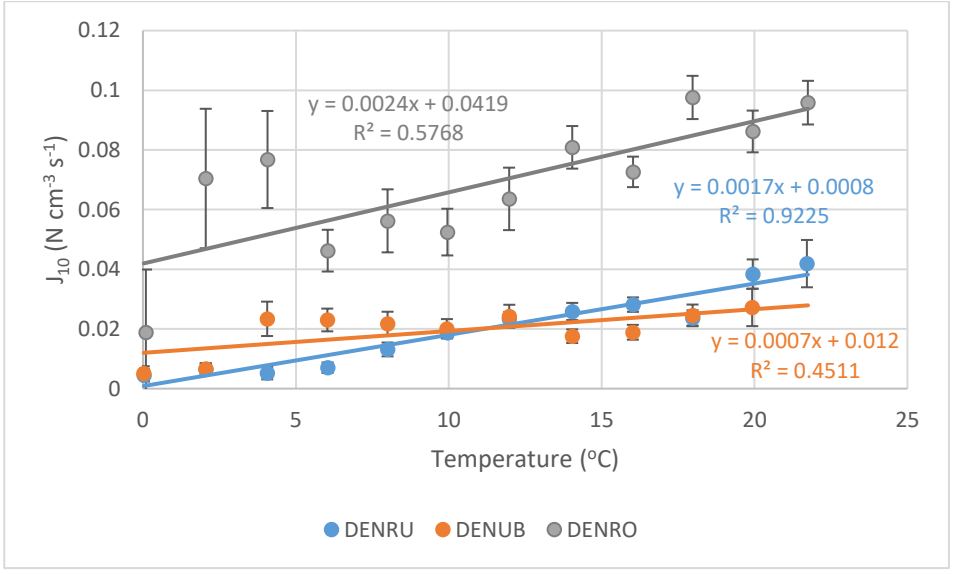
132
133



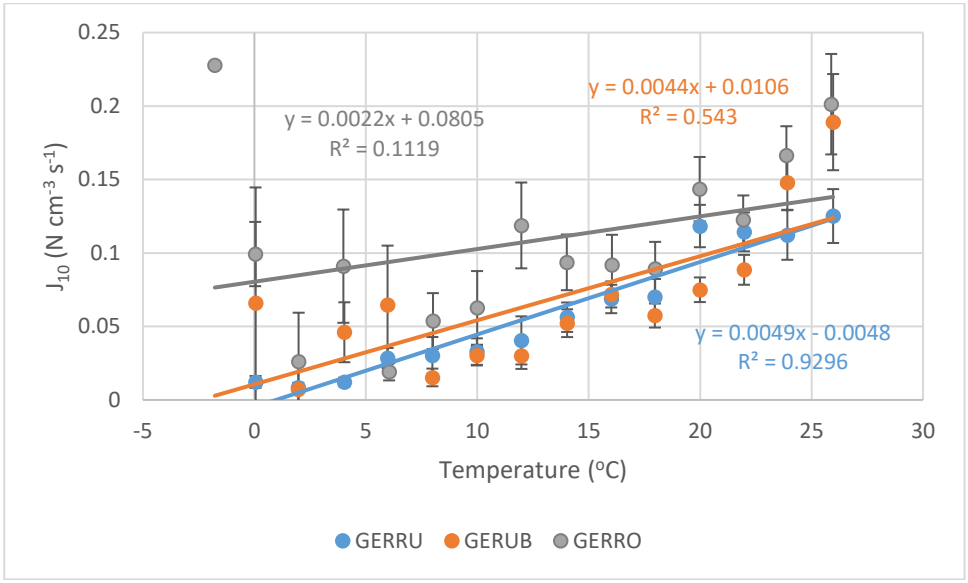
134
135
136



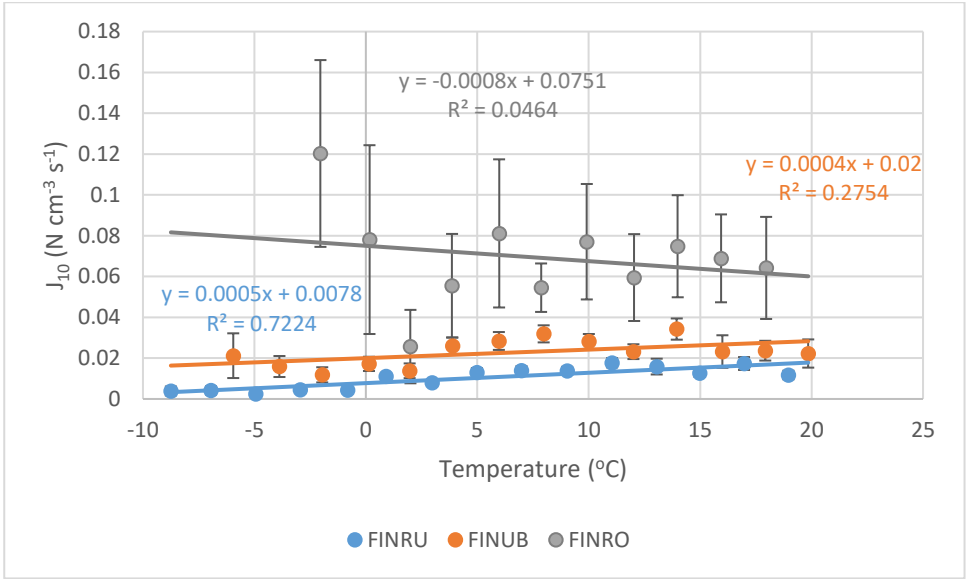
137
138



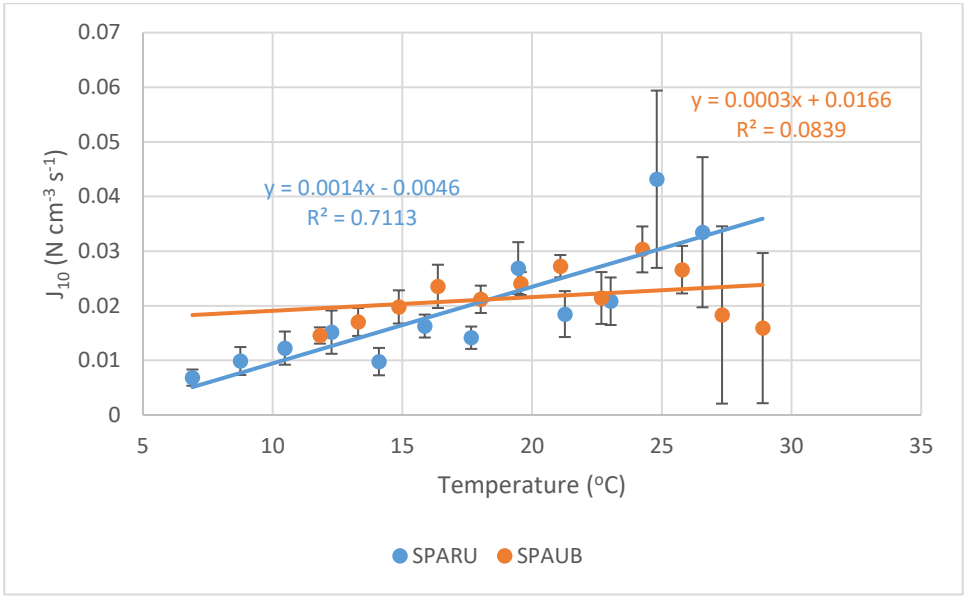
139
140



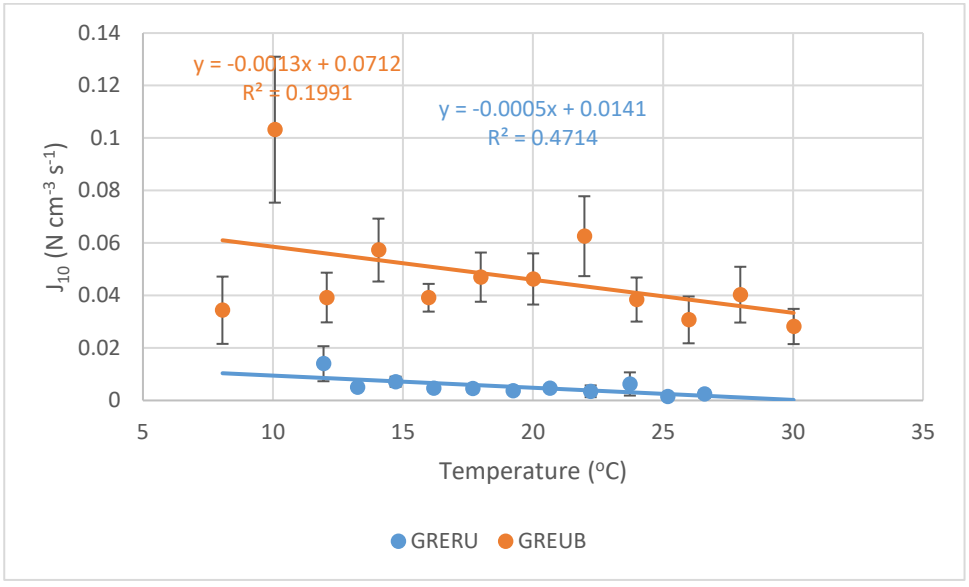
141
142



143
144
145



146
147
148



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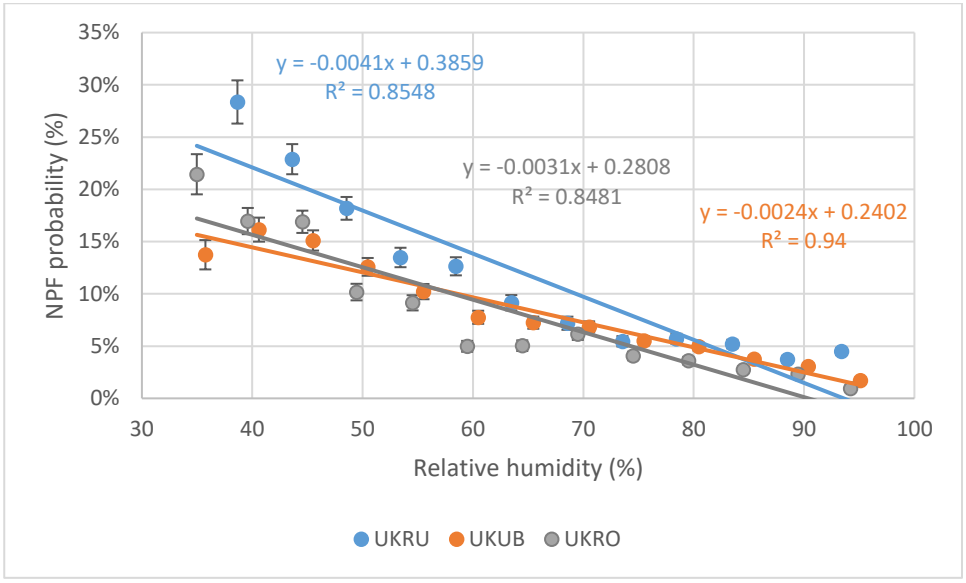

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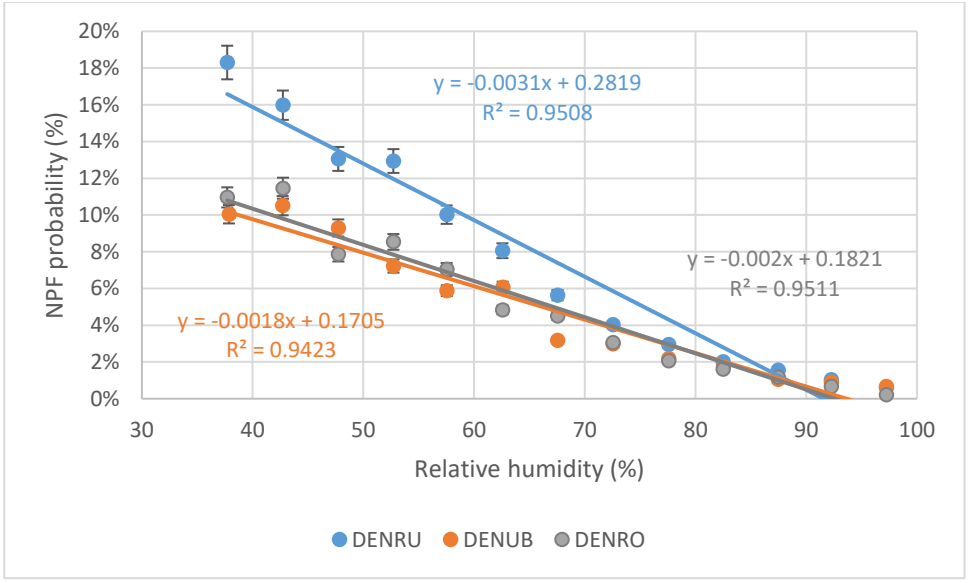

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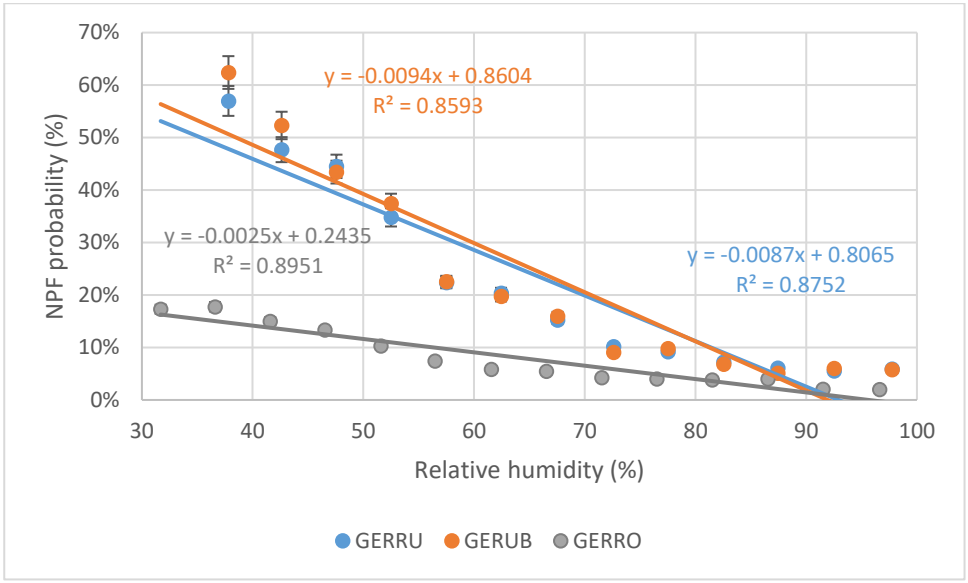

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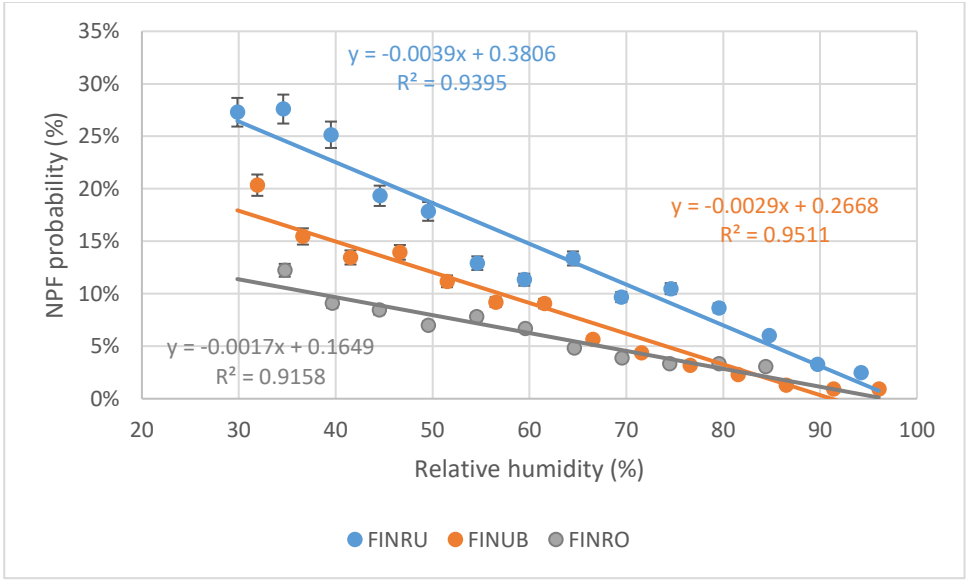

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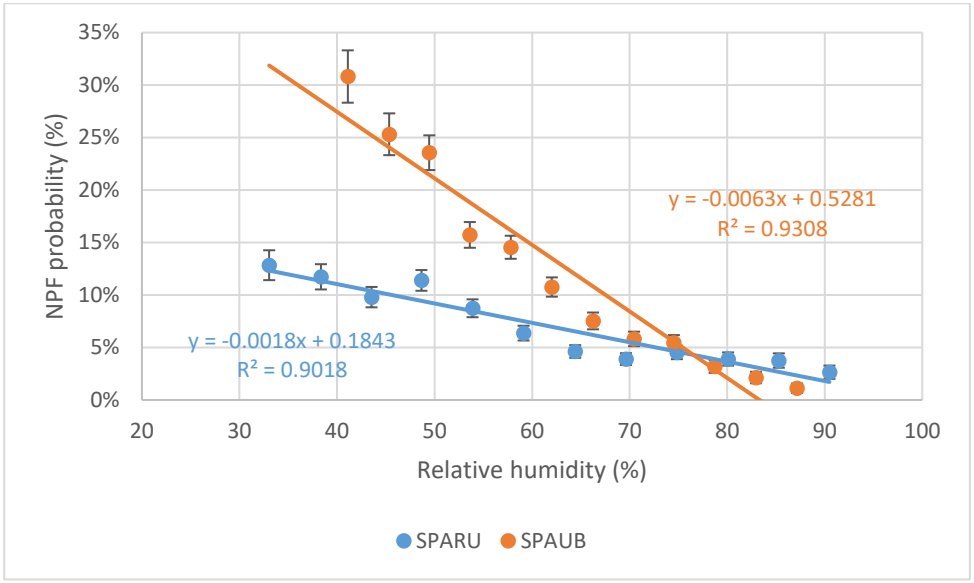

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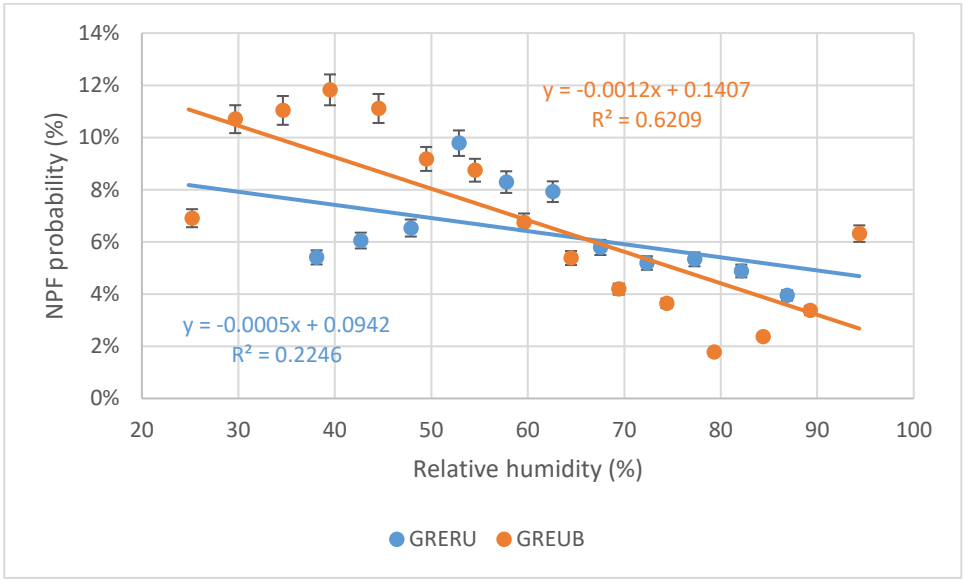

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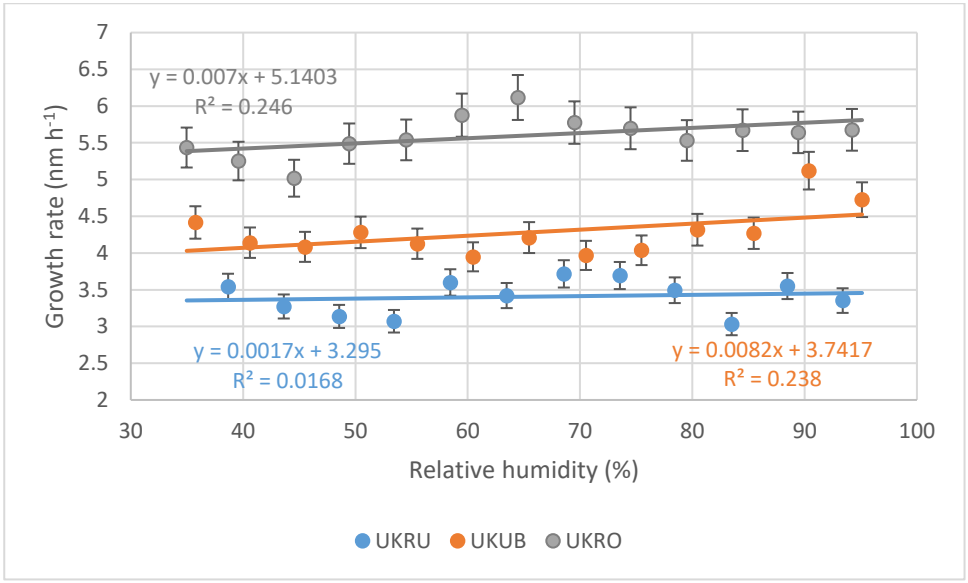

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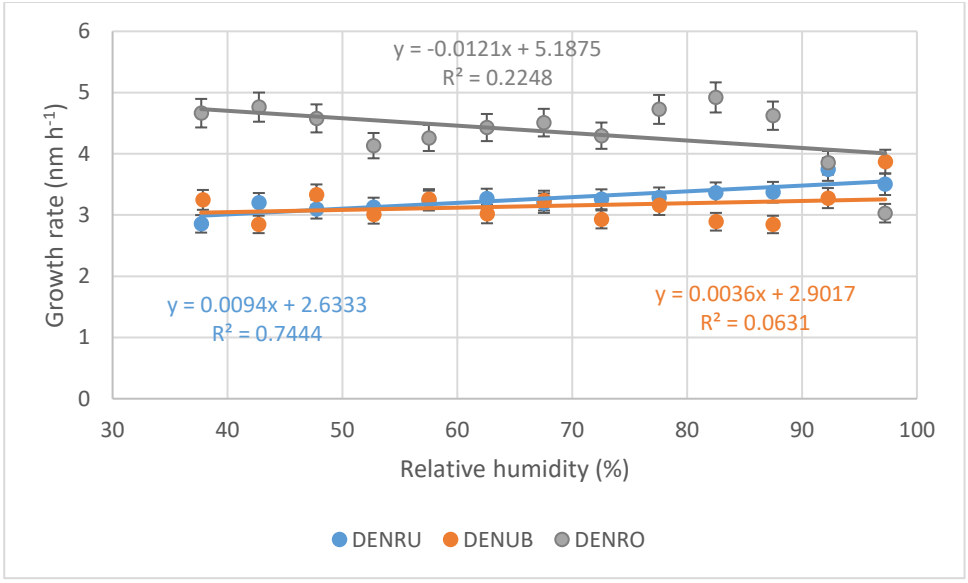

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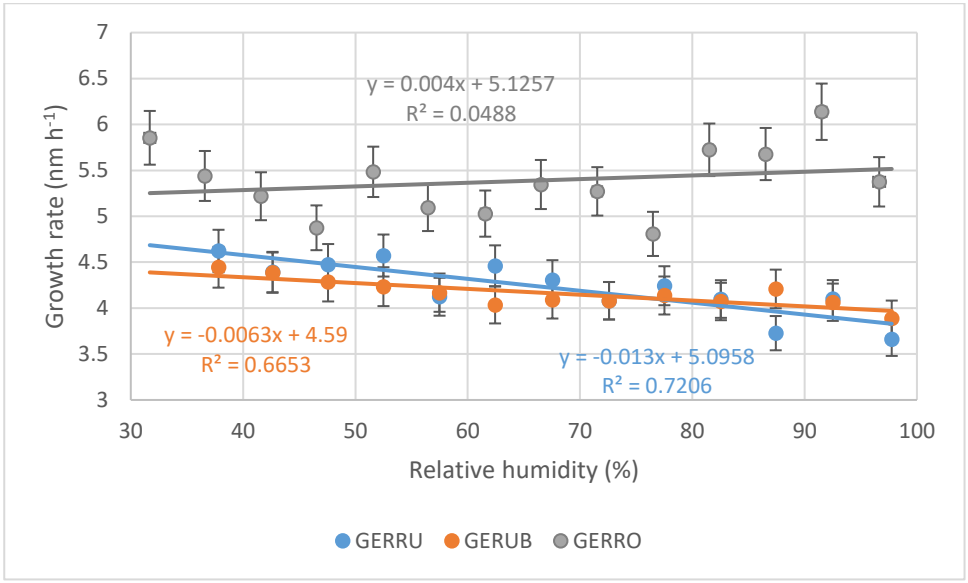

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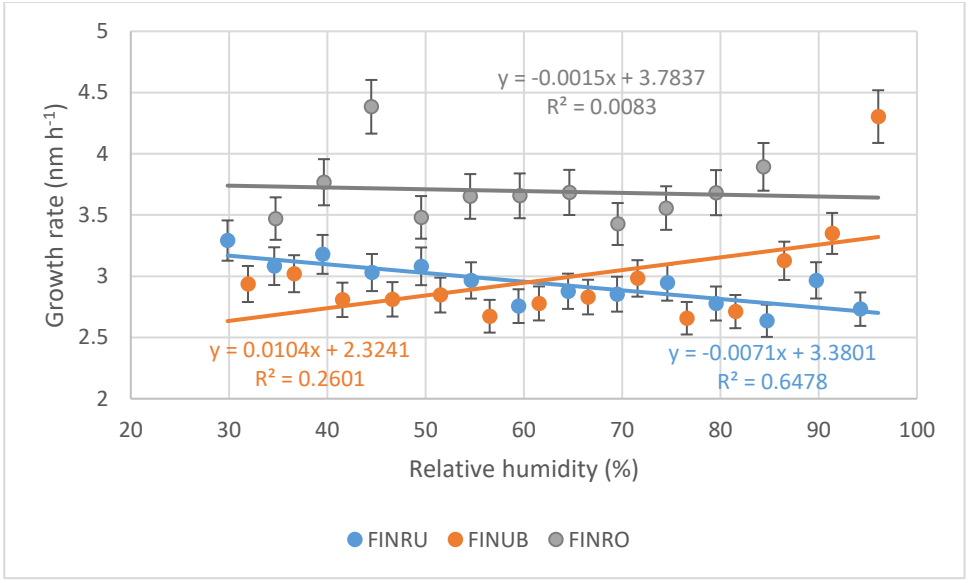

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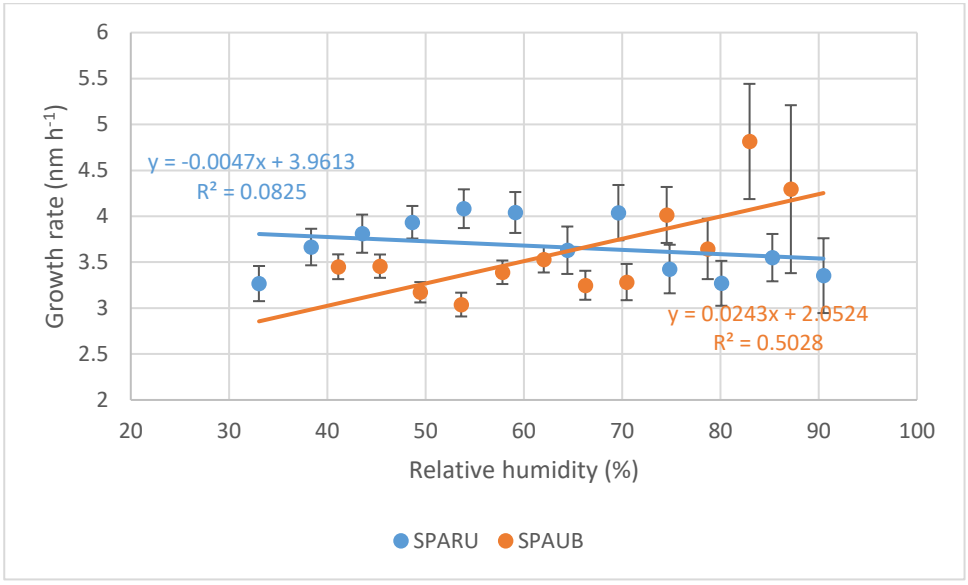

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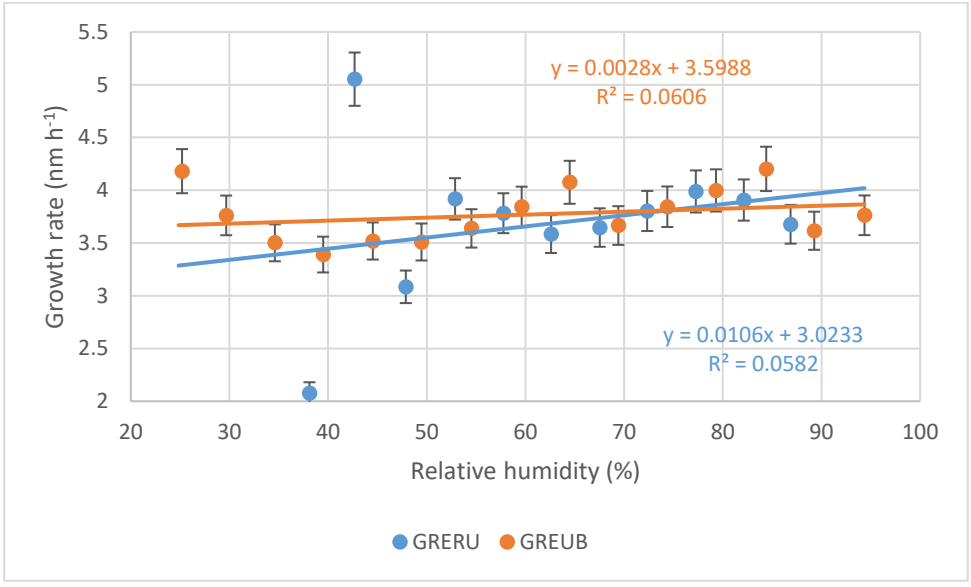

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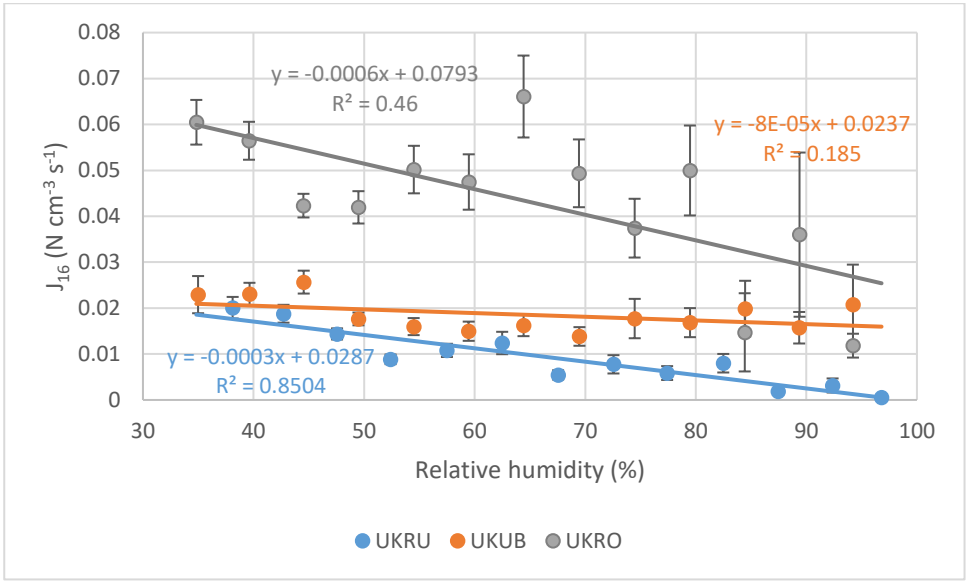

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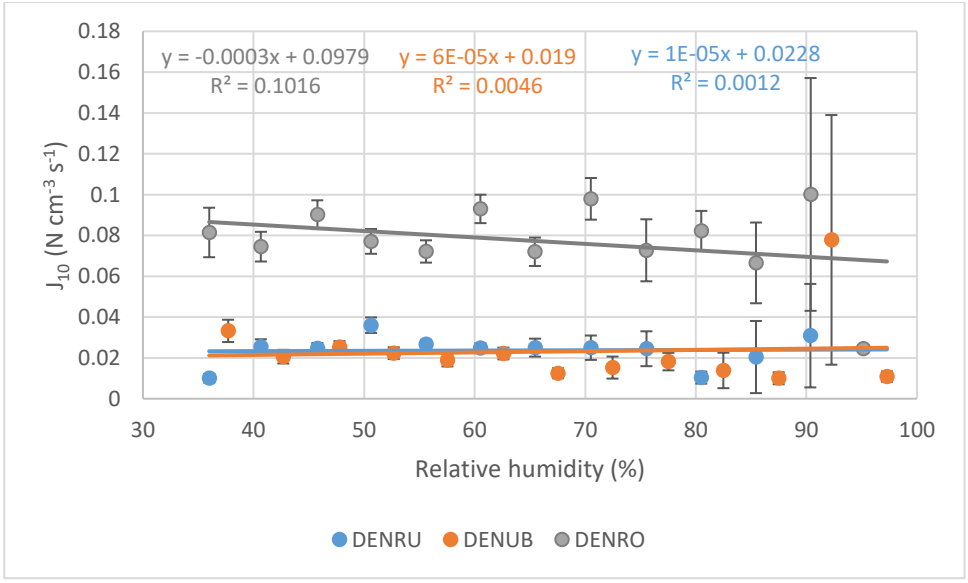

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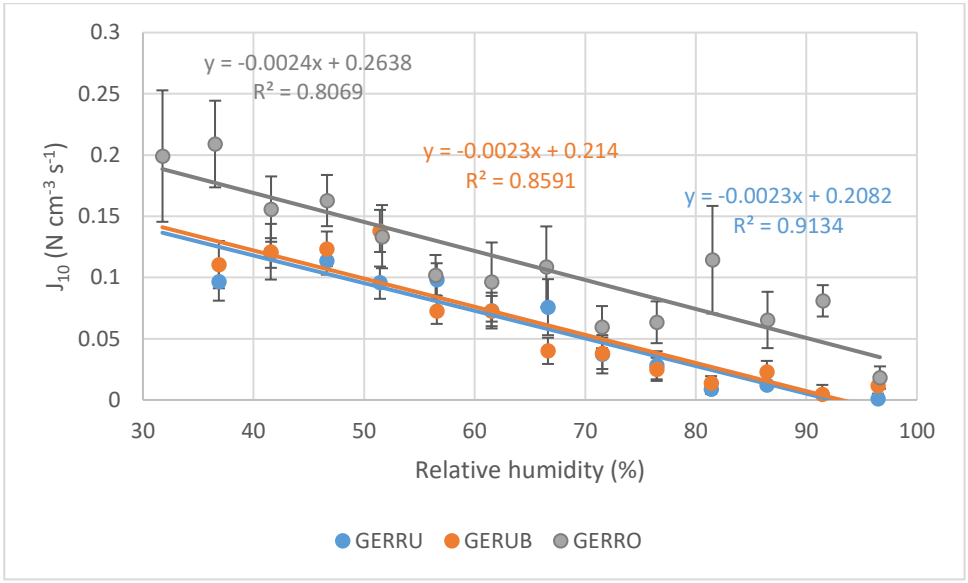

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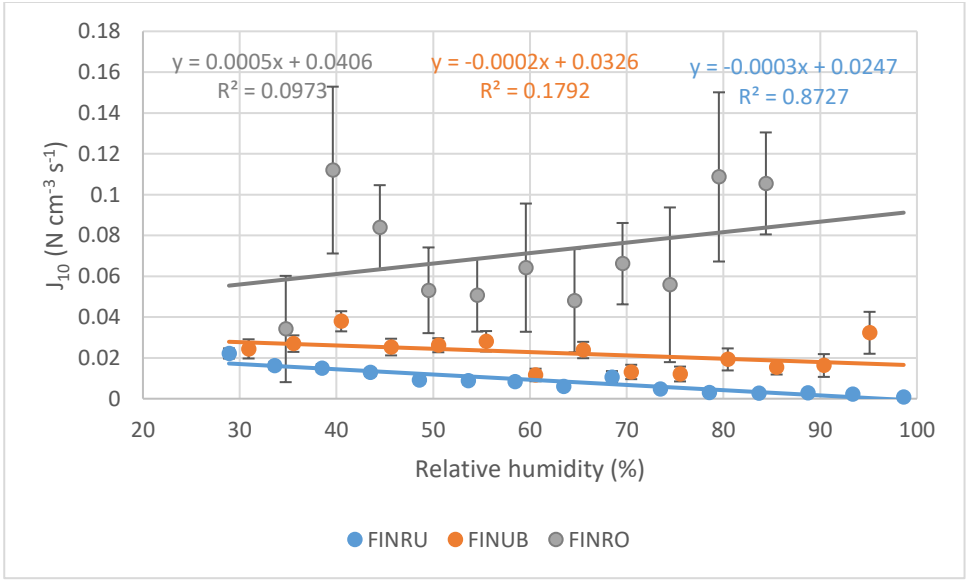

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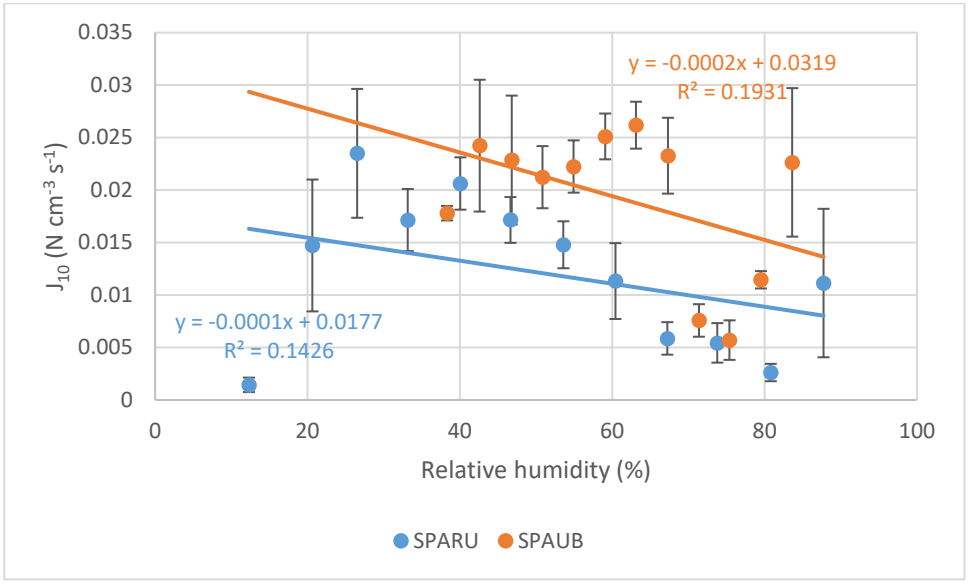

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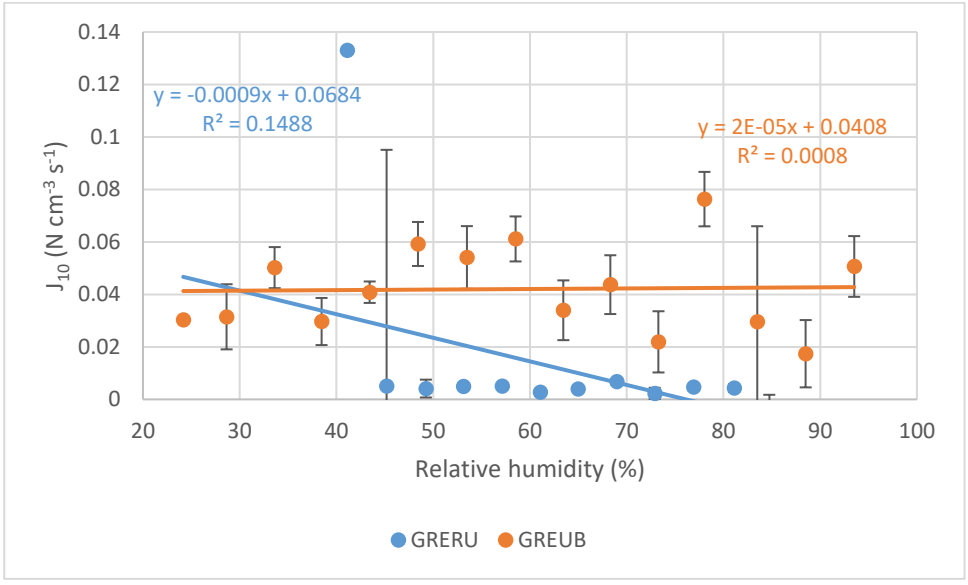

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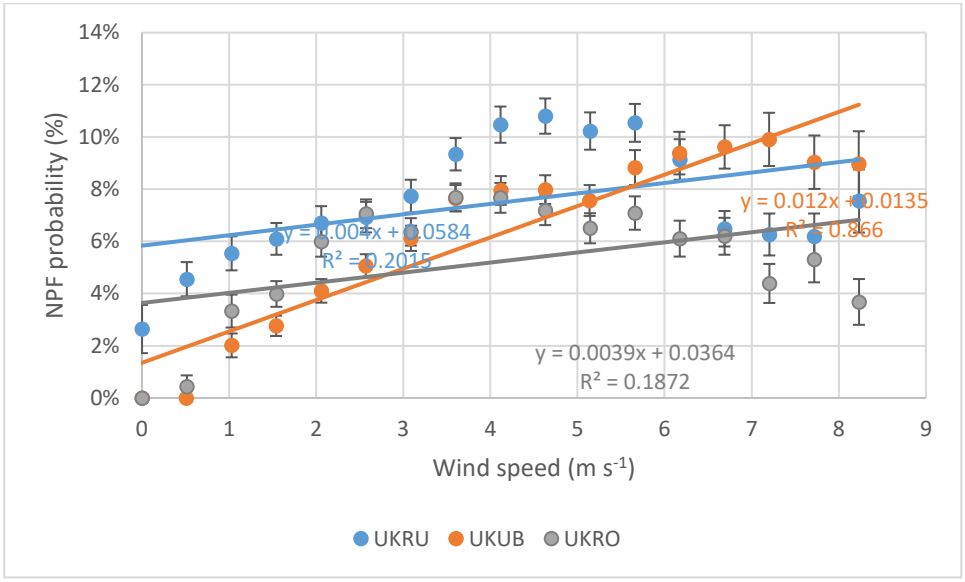

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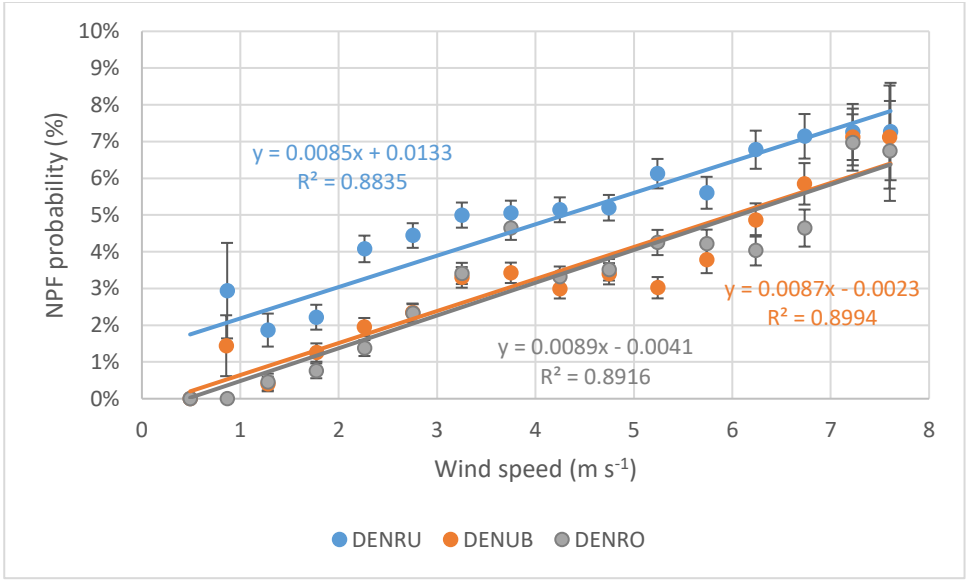

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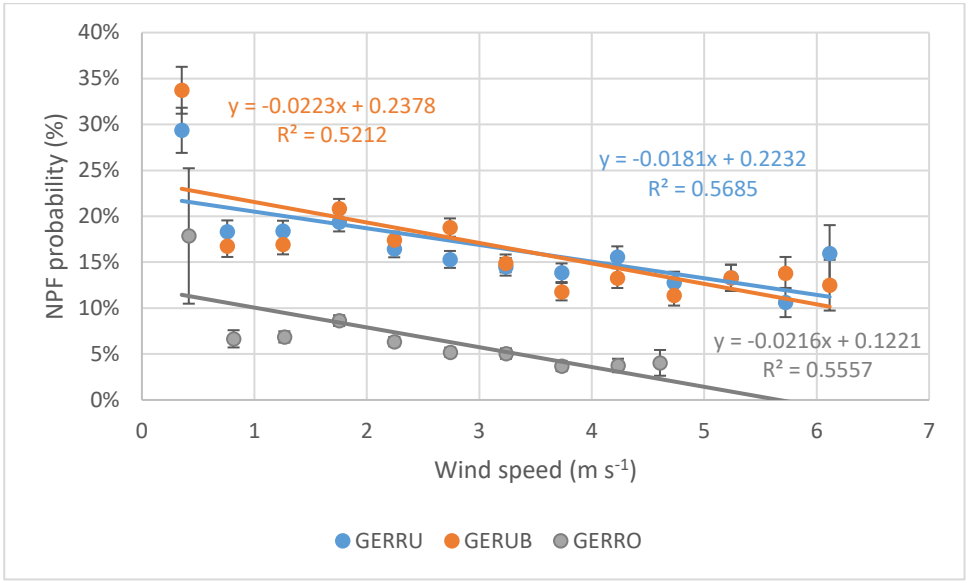

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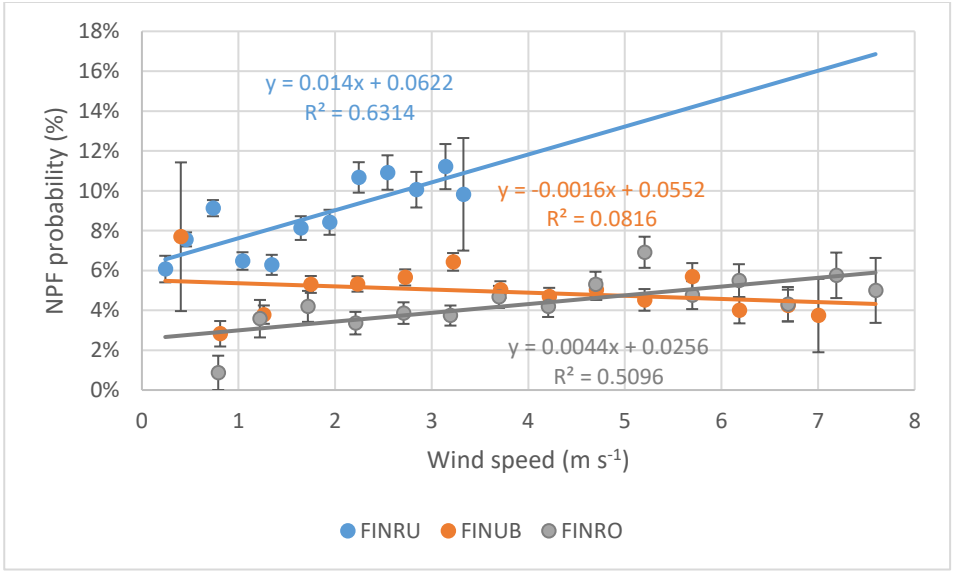

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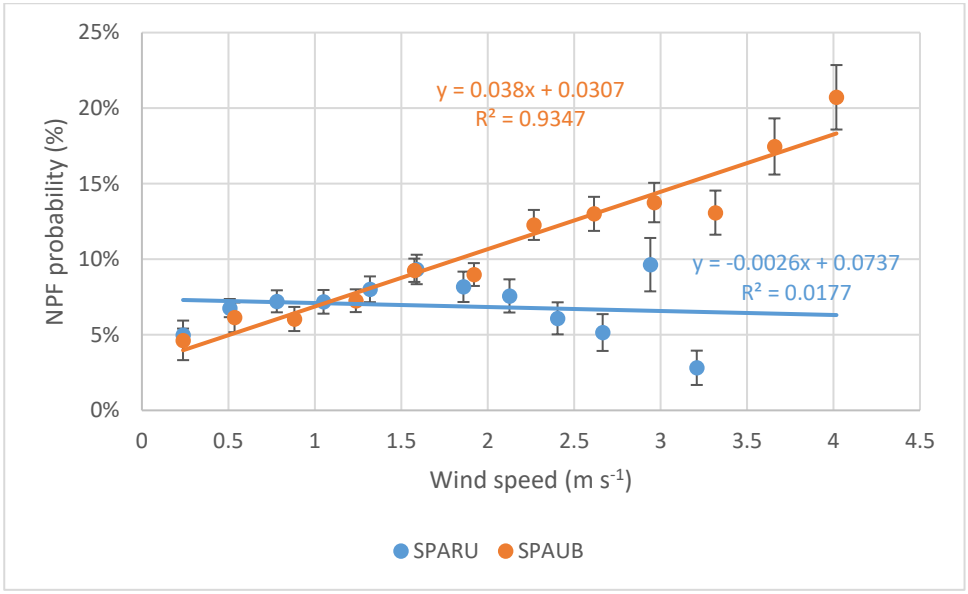

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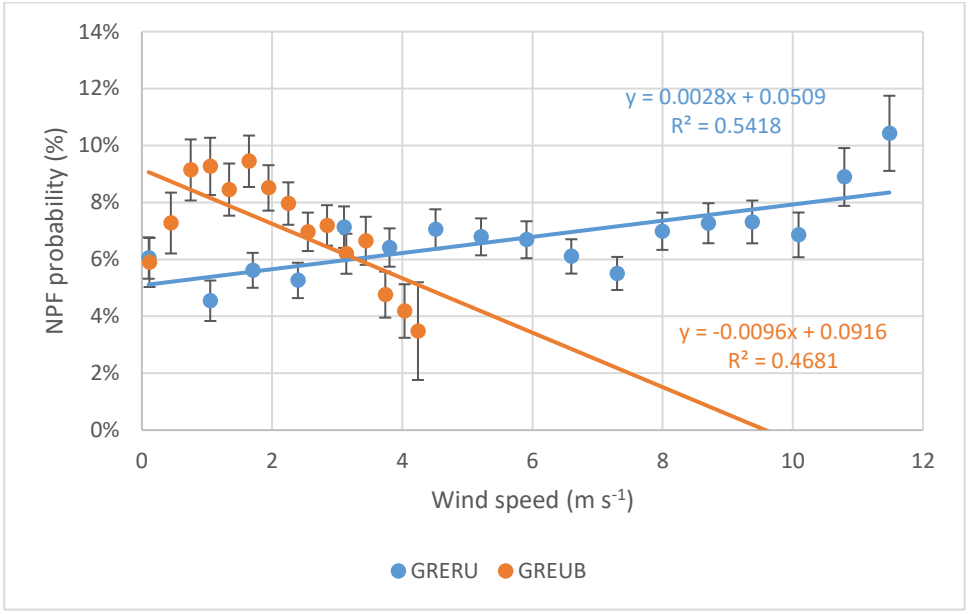

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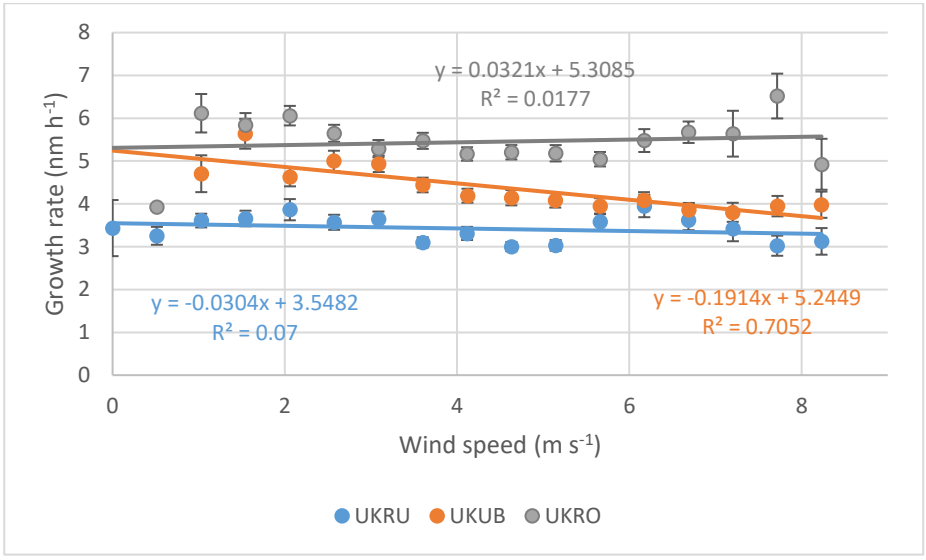

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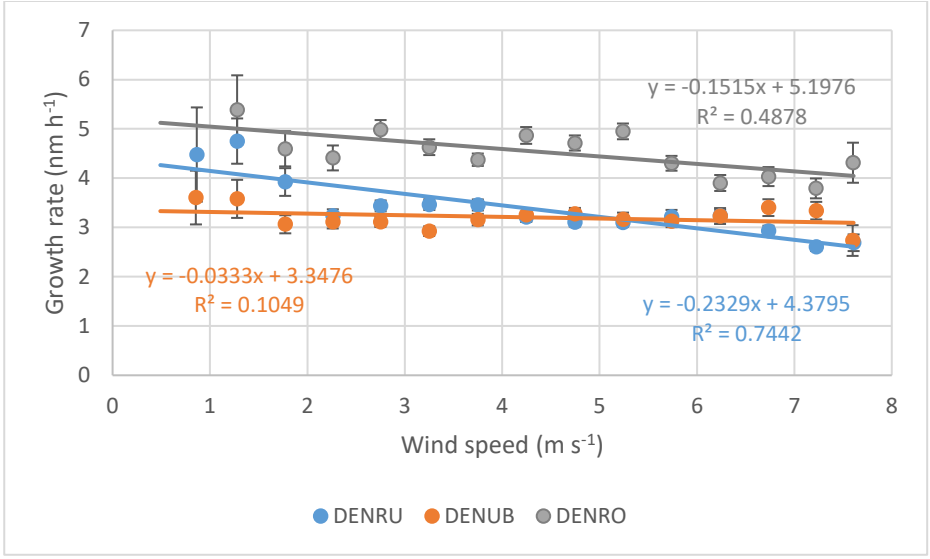

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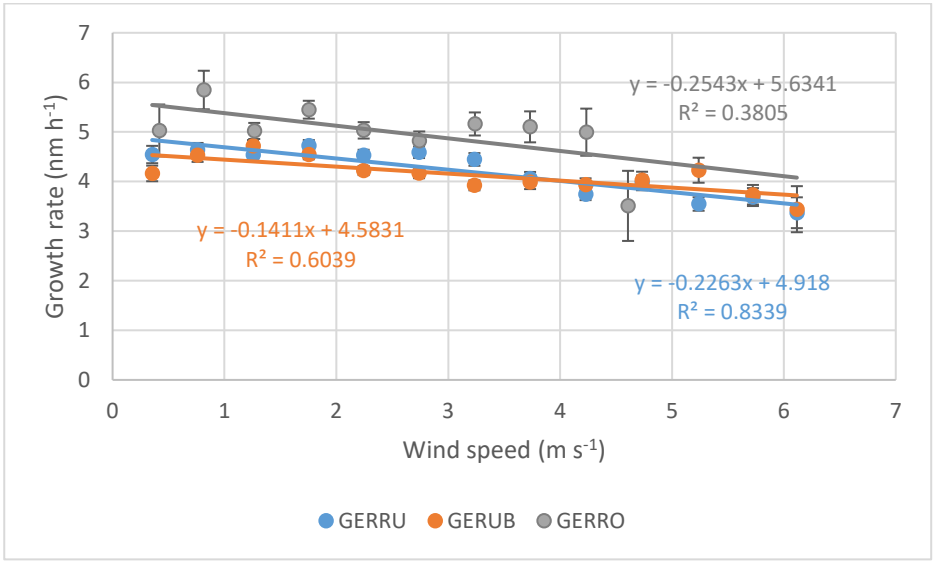

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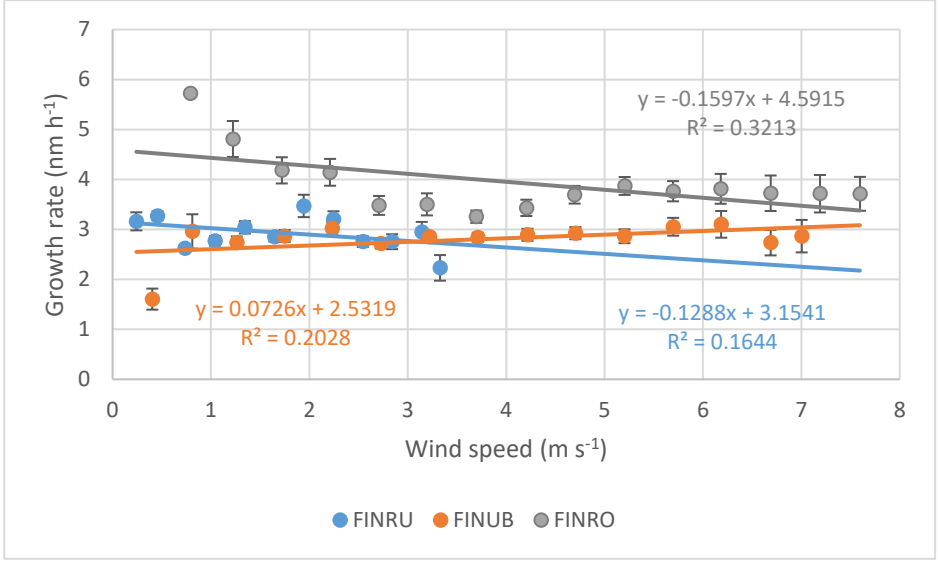

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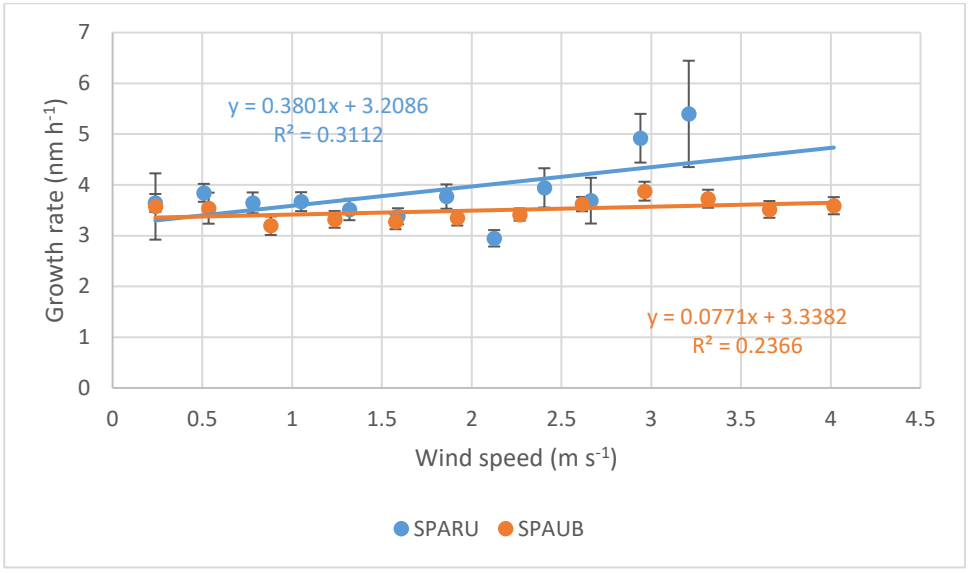

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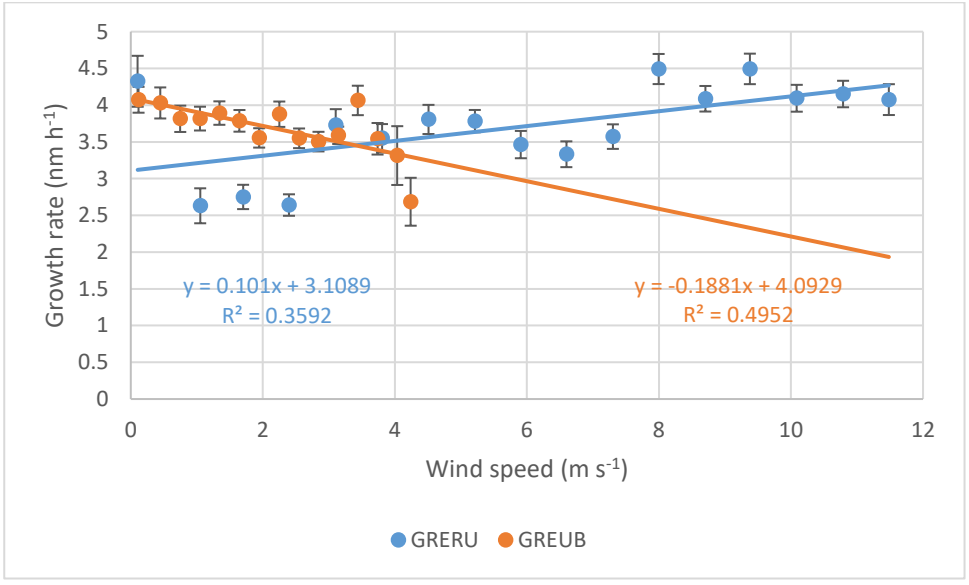

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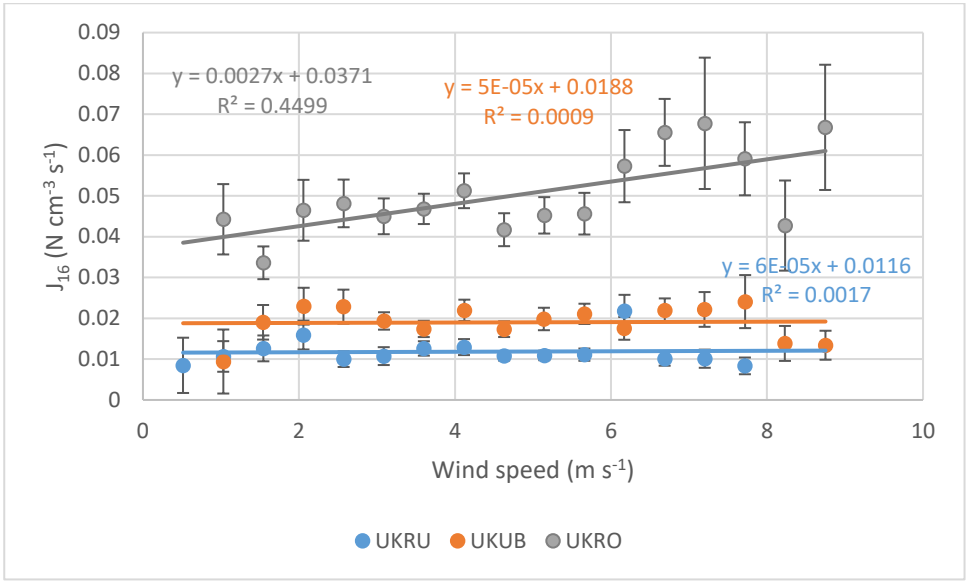

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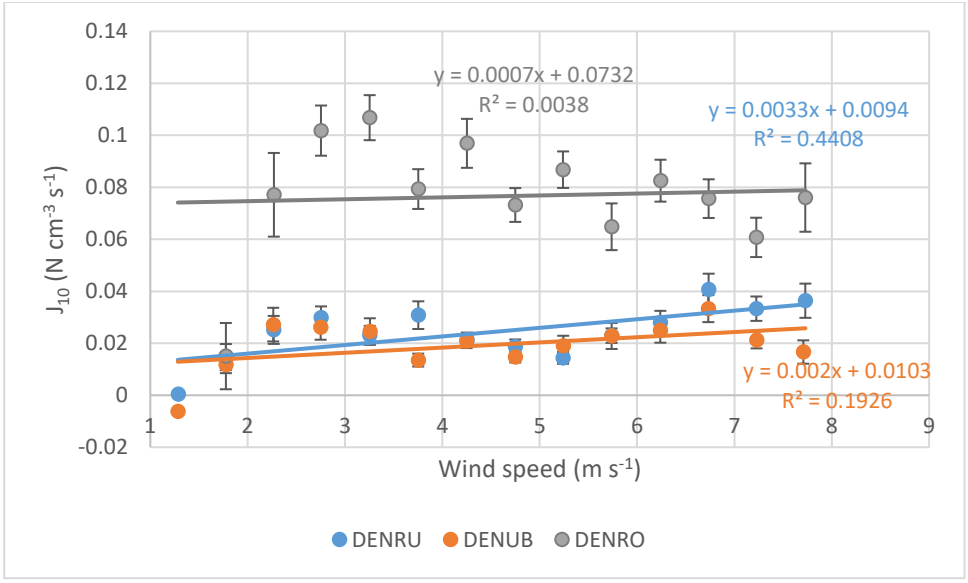

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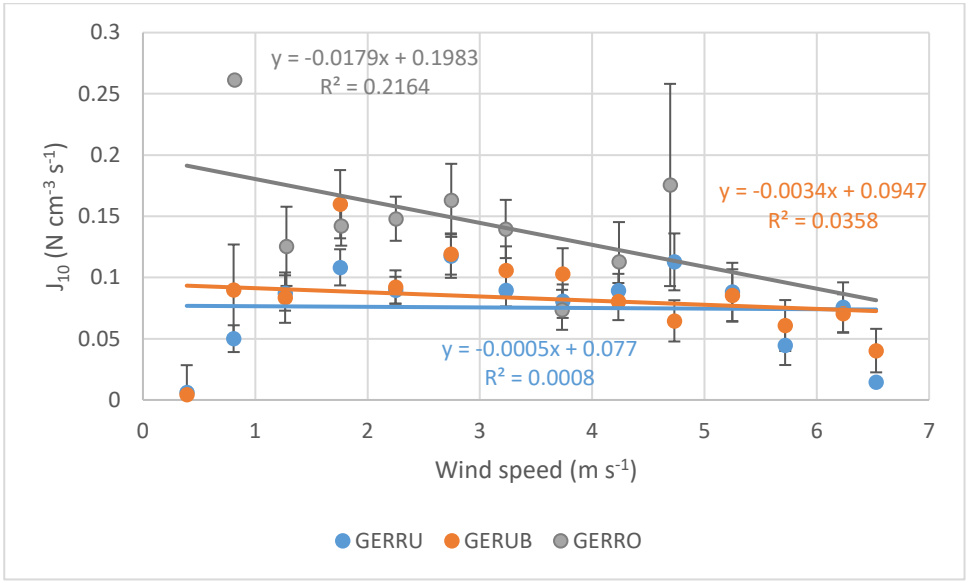

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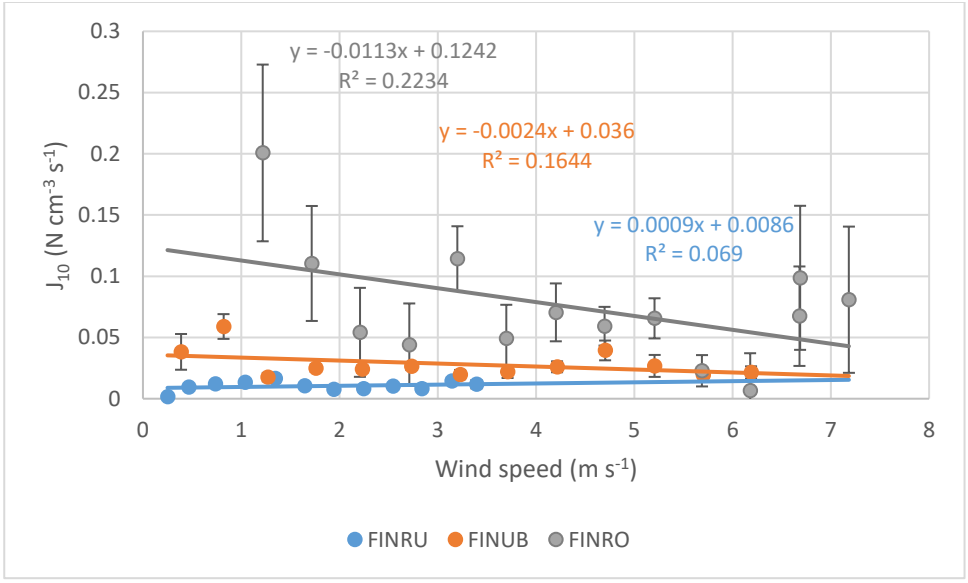

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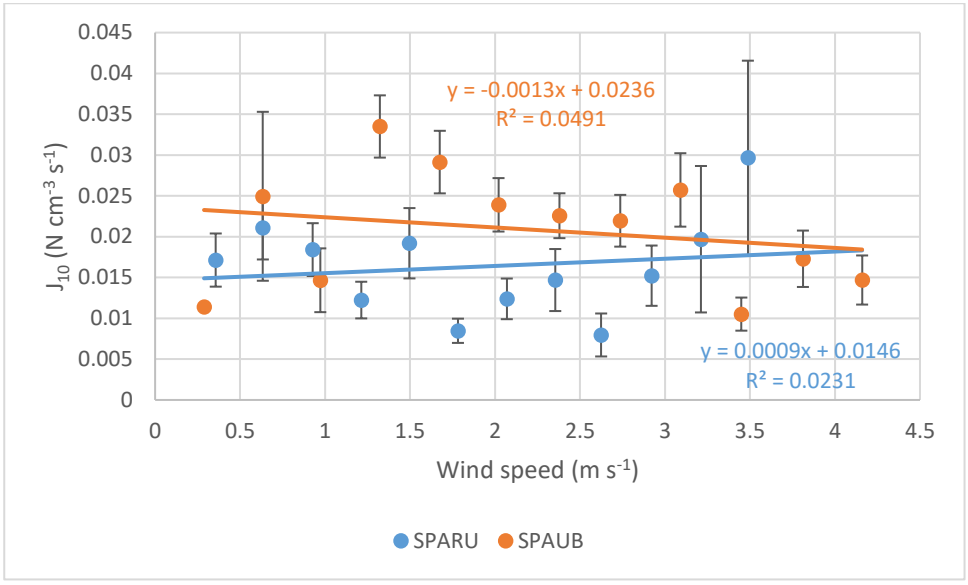

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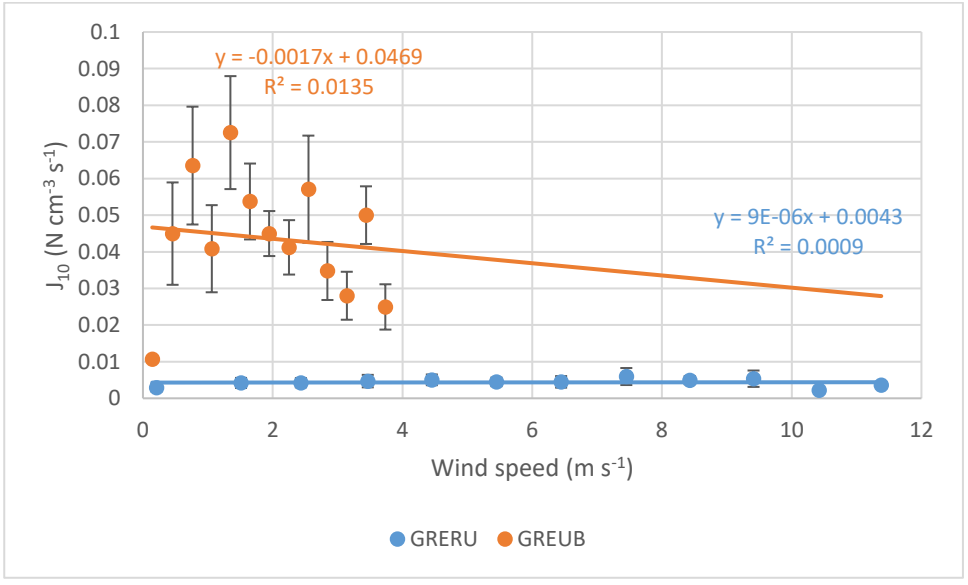

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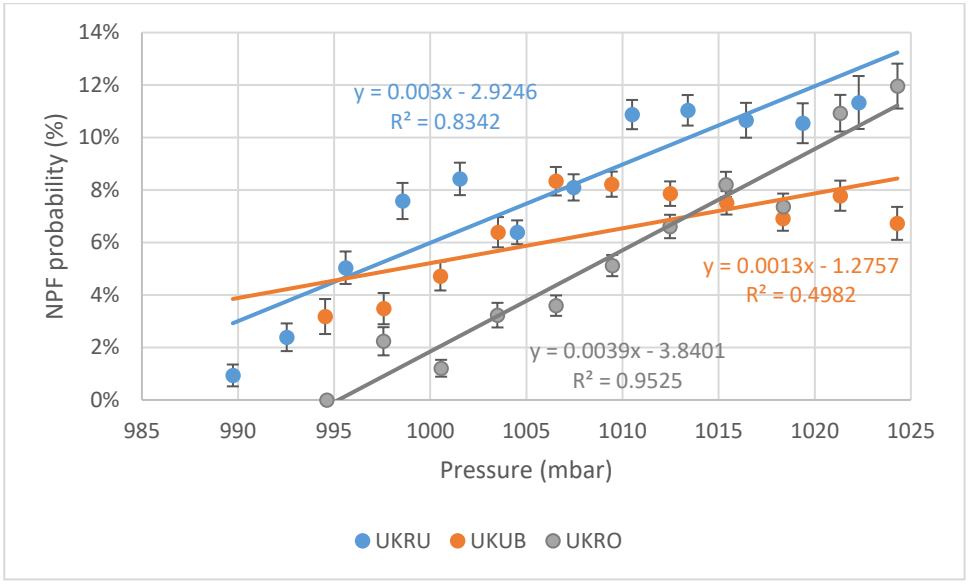

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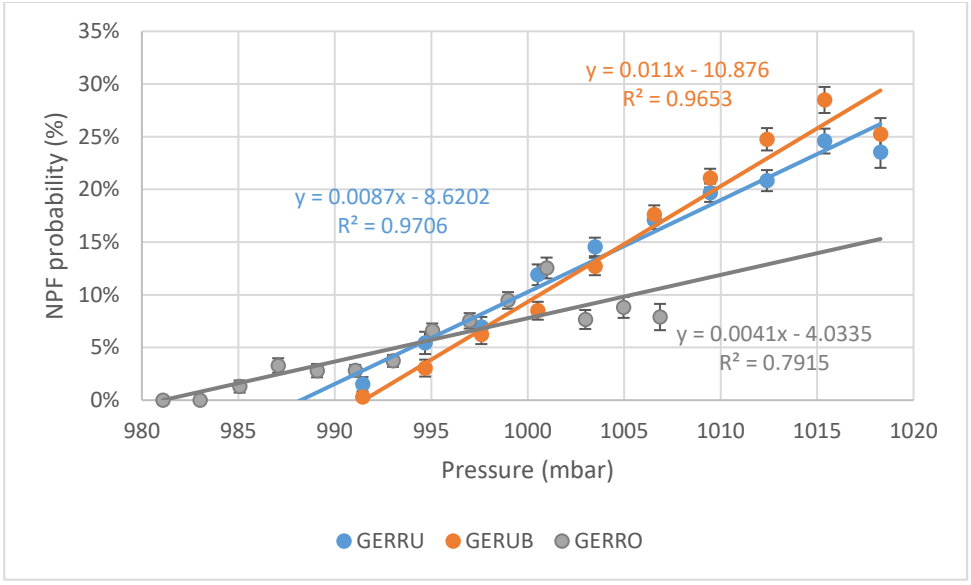

245

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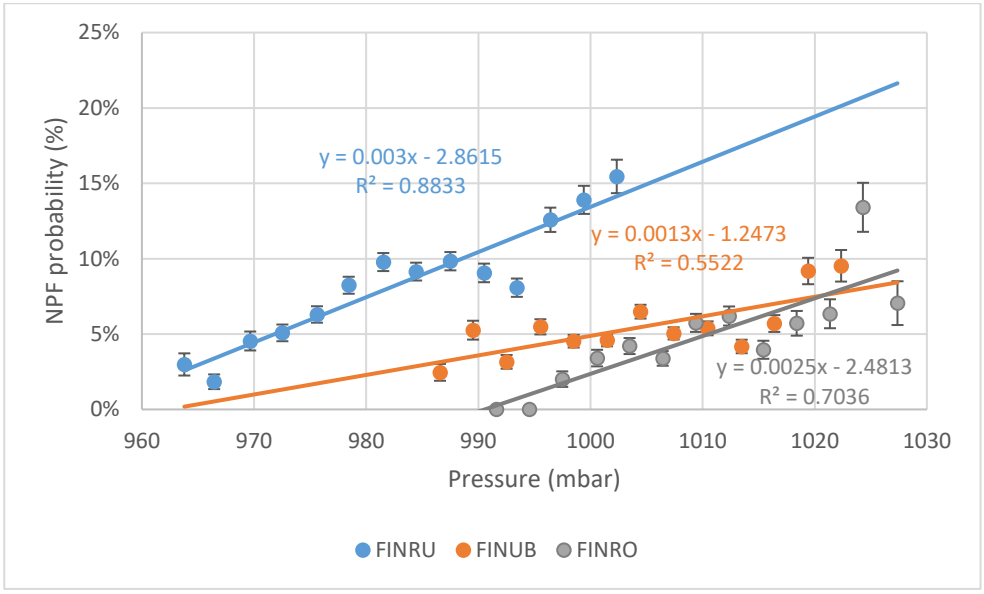

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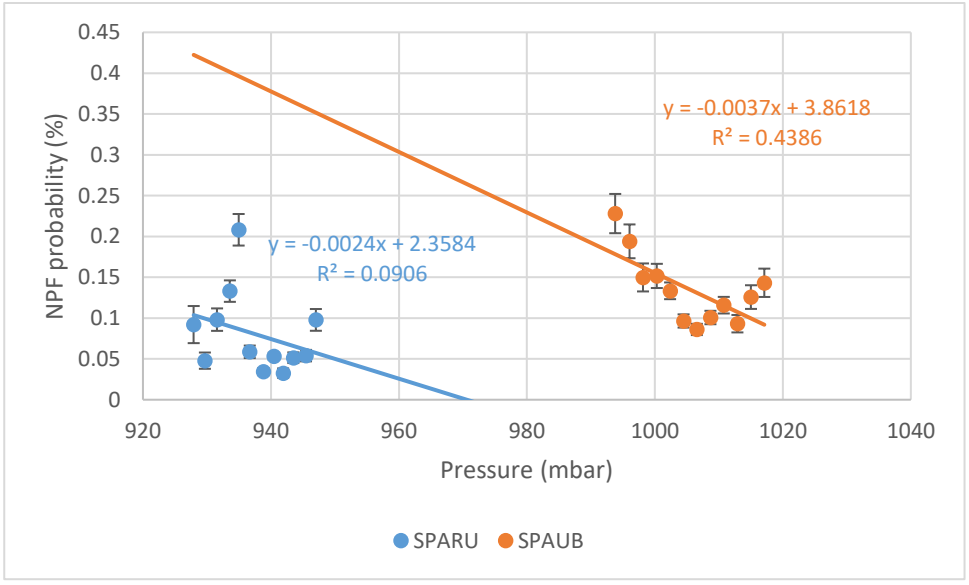

249

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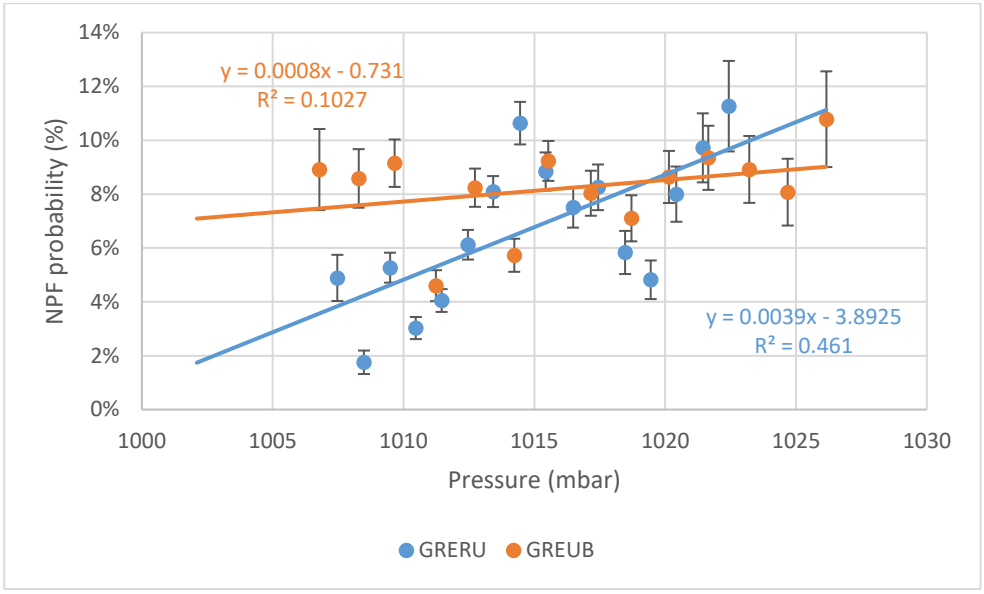
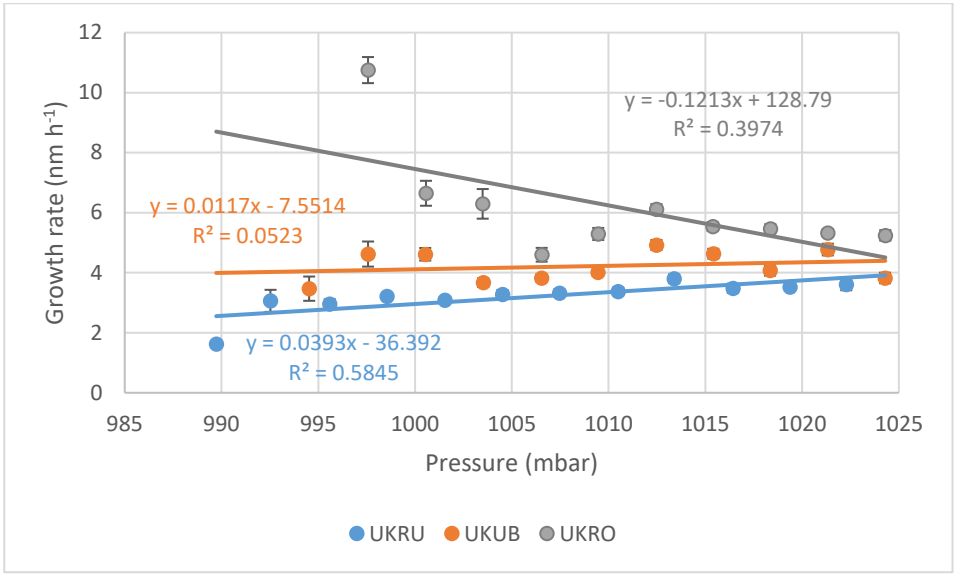

14%
12%
10%
8%
6%
4%
2%
0%
NPF probability (%)
y = 0.0008x - 0.731
R² = 0.1027
y = 0.0039x - 3.8925
R² = 0.461
1000
1005
1010
1015
1020
1025
1030
Pressure (mbar)
GRERU
GREUB

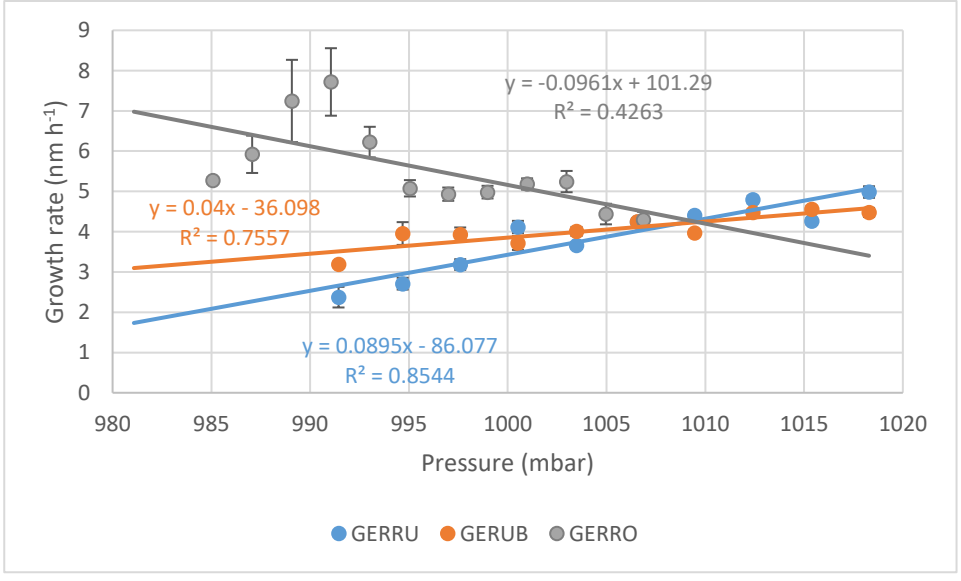
251

252



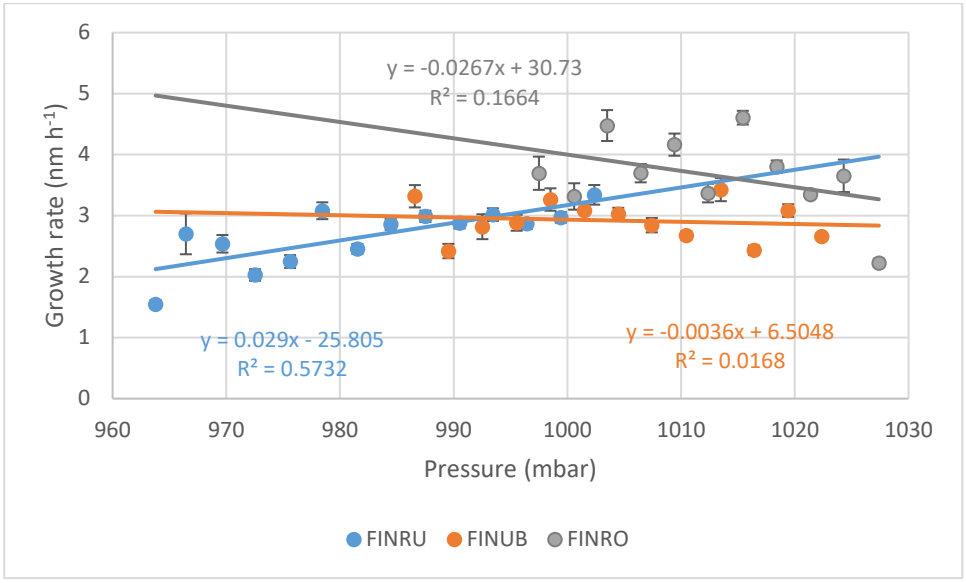
253

254



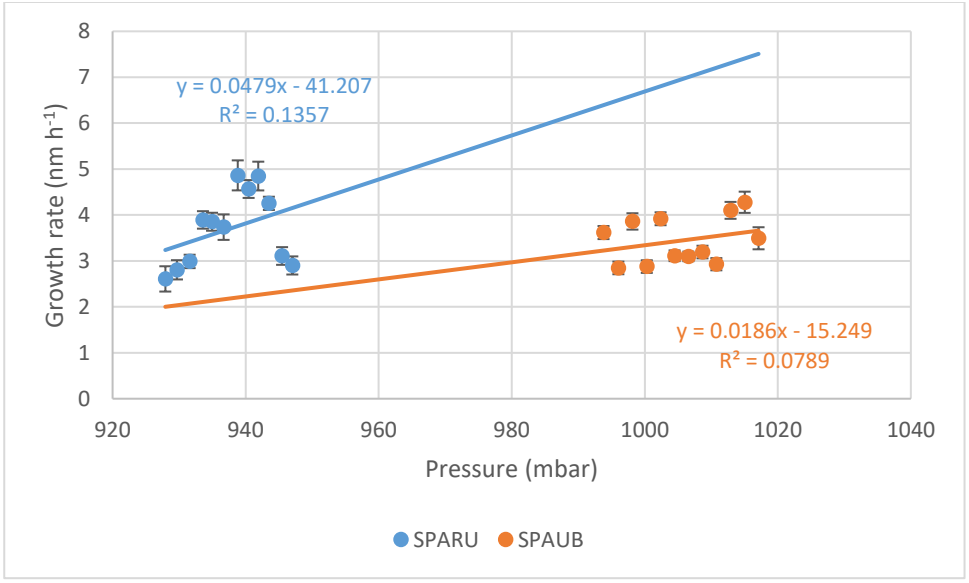
255

256



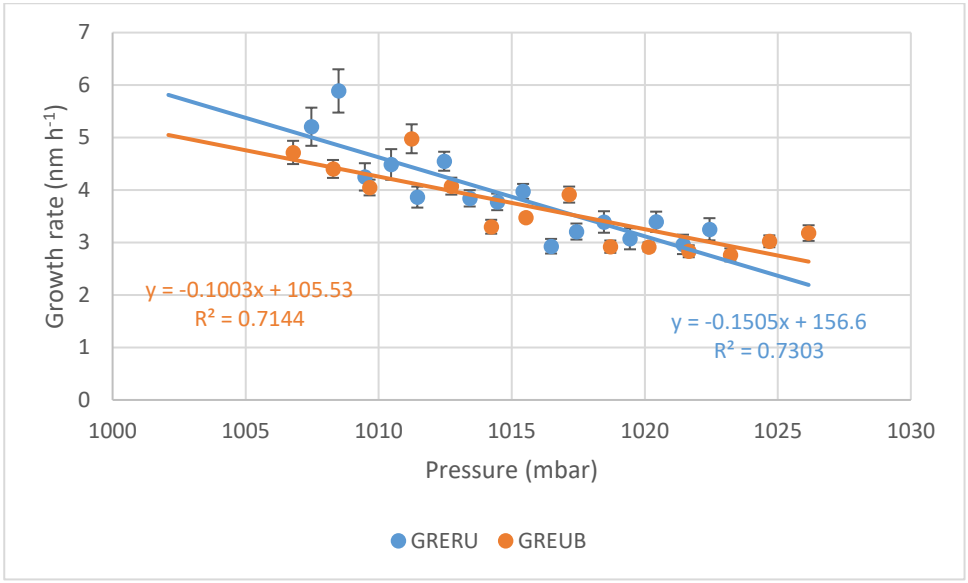
257

258



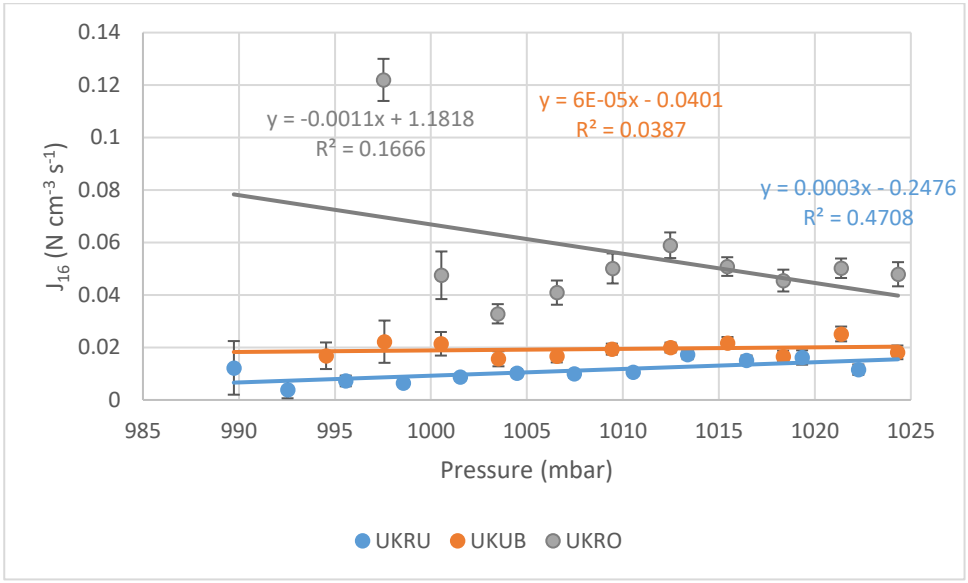
259

260


Growth rate (nm h-1)
Pressure (mbar)
y = -0.1003x + 105.53
R² = 0.7144
y = -0.1505x + 156.6
R² = 0.7303
GRERU
GREUB

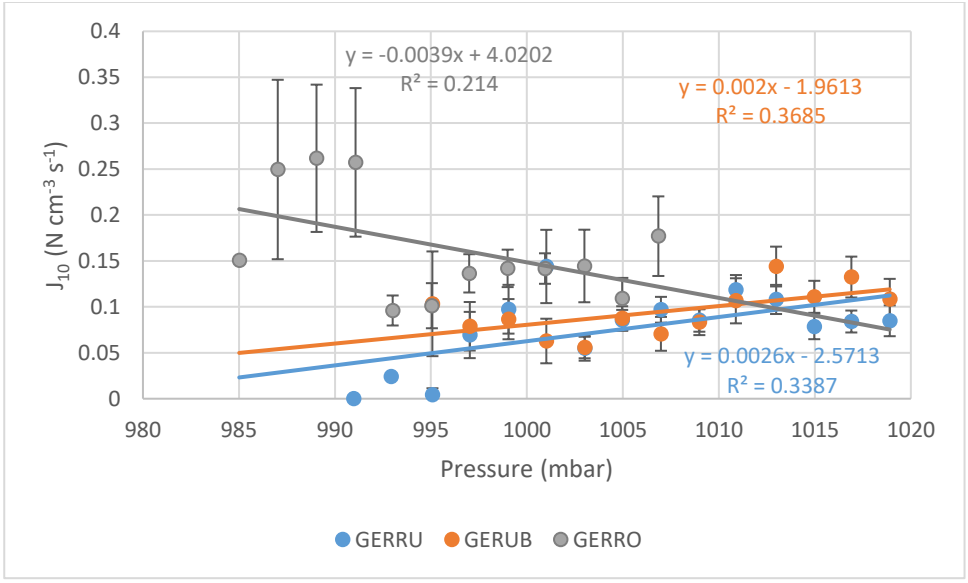
261

262



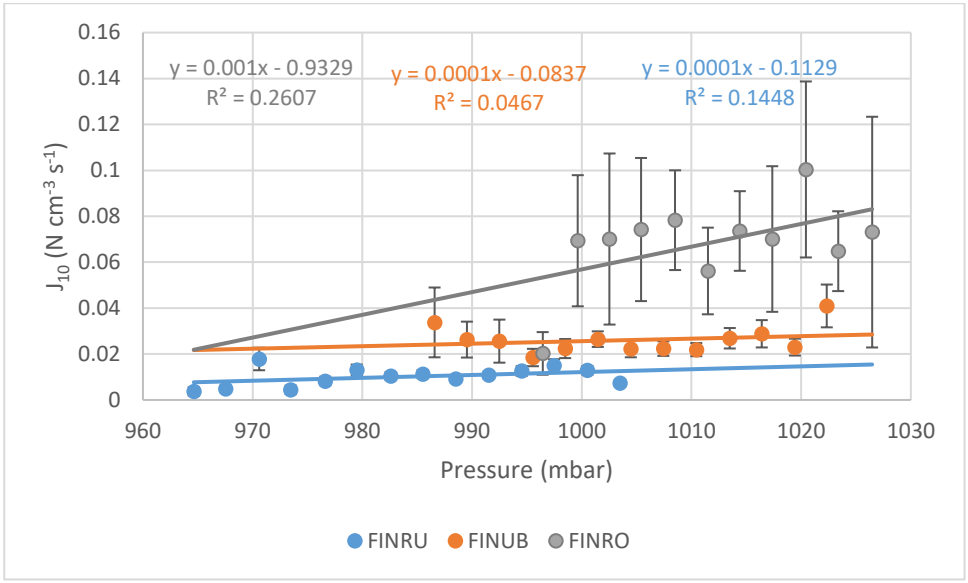
263

264



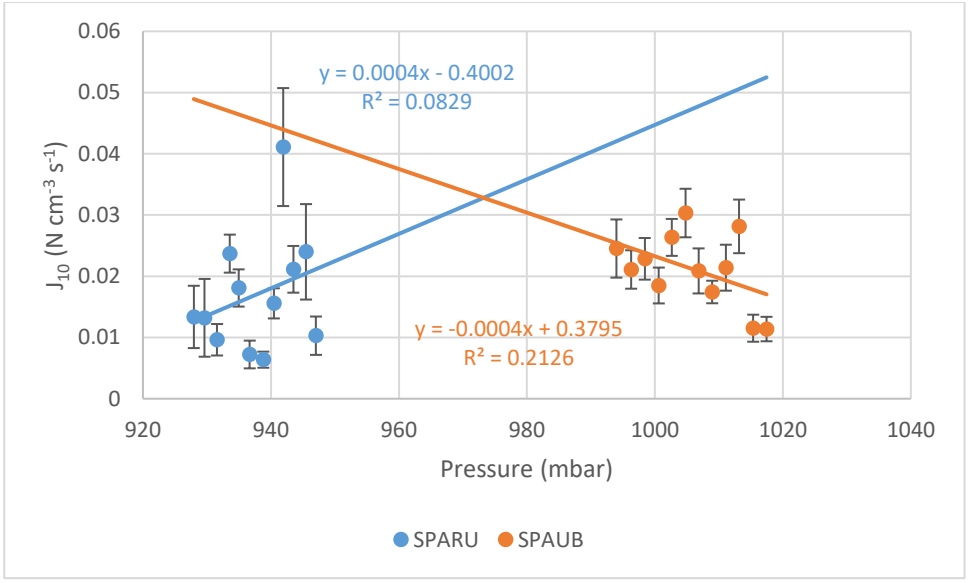
265

266



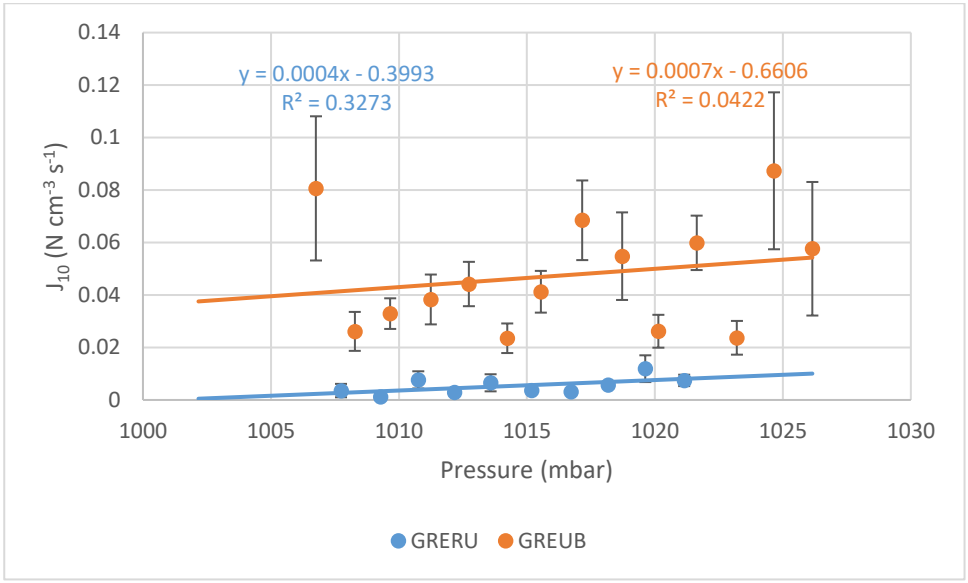
267

268



269

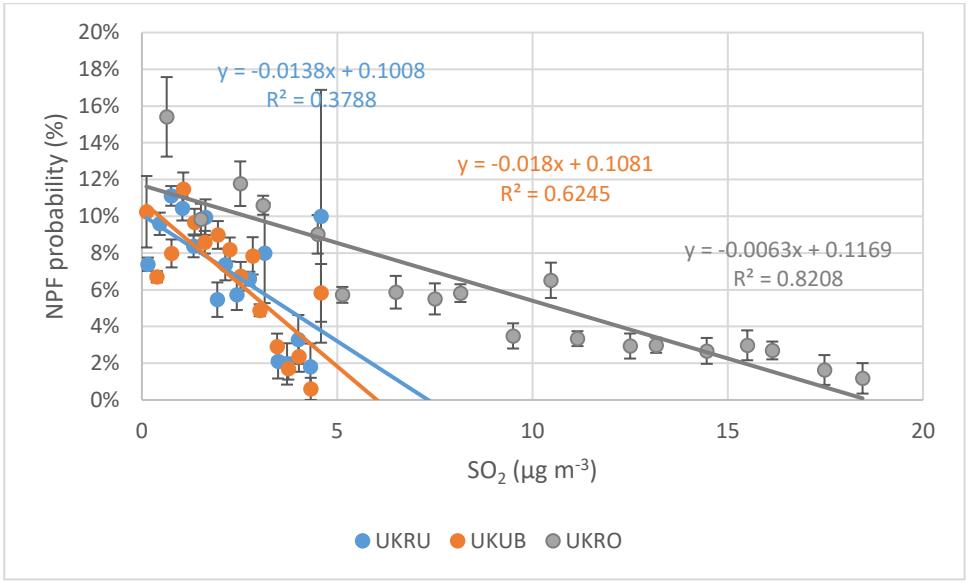
270


0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
J10 (N cm-3 s-1)
y = 0.0004x - 0.3993
R² = 0.3273
y = 0.0007x - 0.6606
R² = 0.0422
1000
1005
1010
1015
1020
1025
1030
Pressure (mbar)
GRERU
GREUB

271

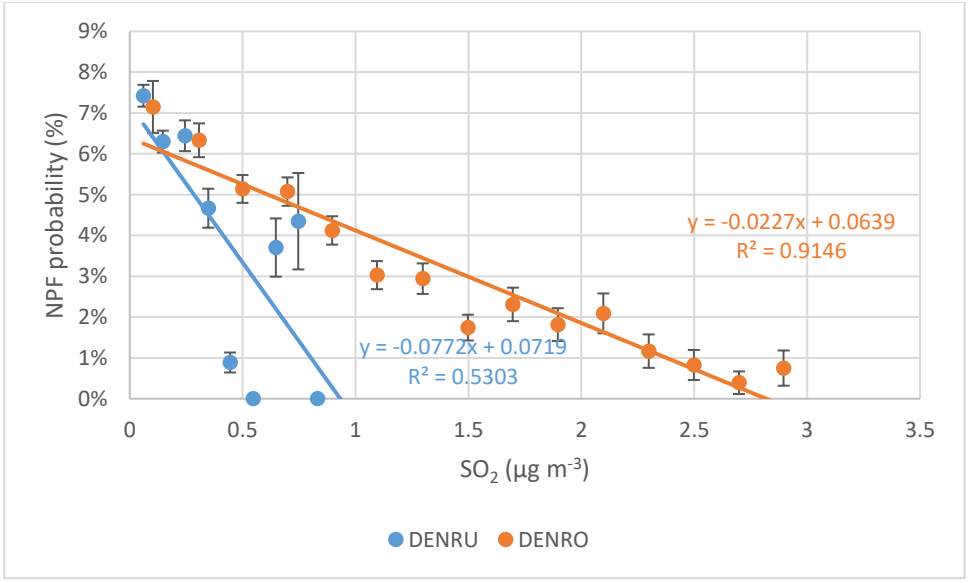
272

273



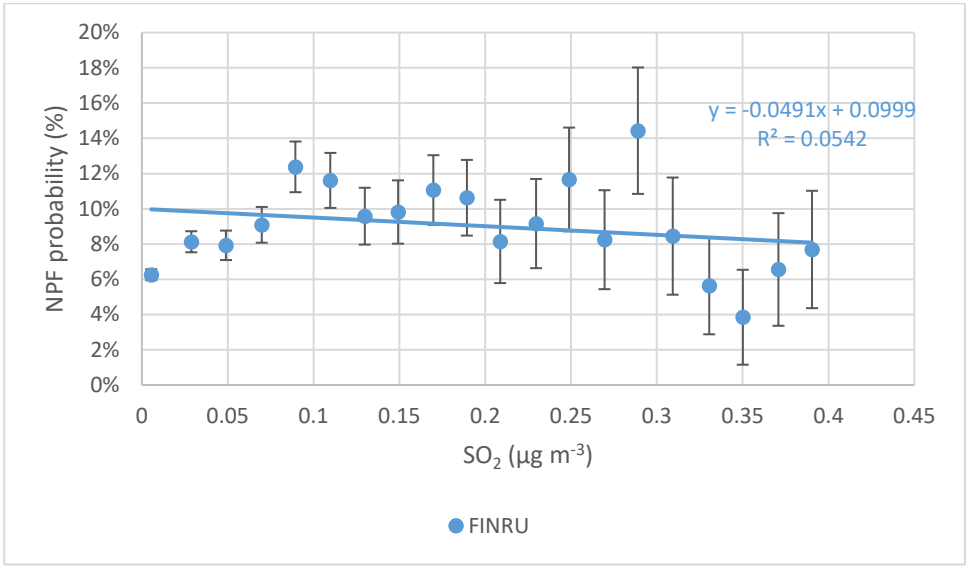
274

275



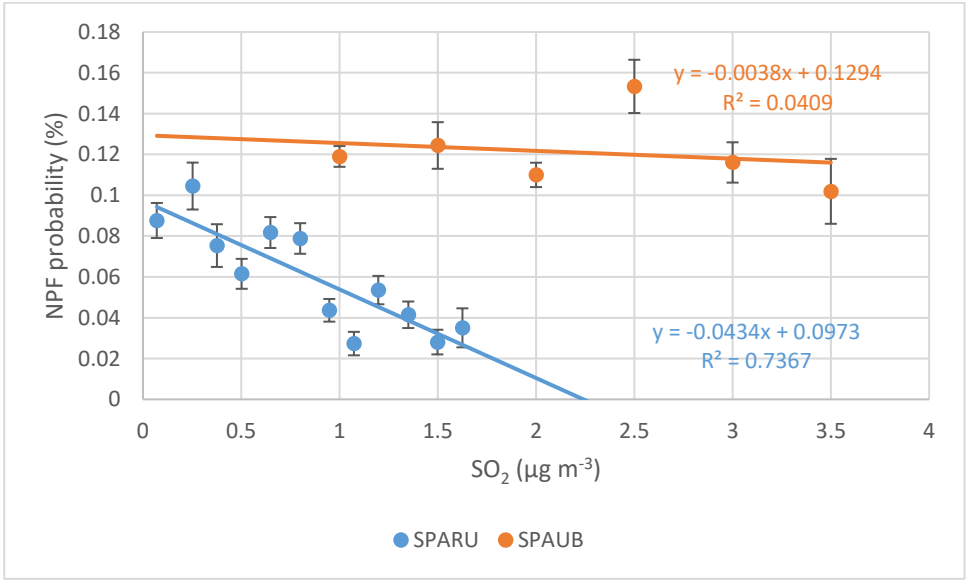
276

277



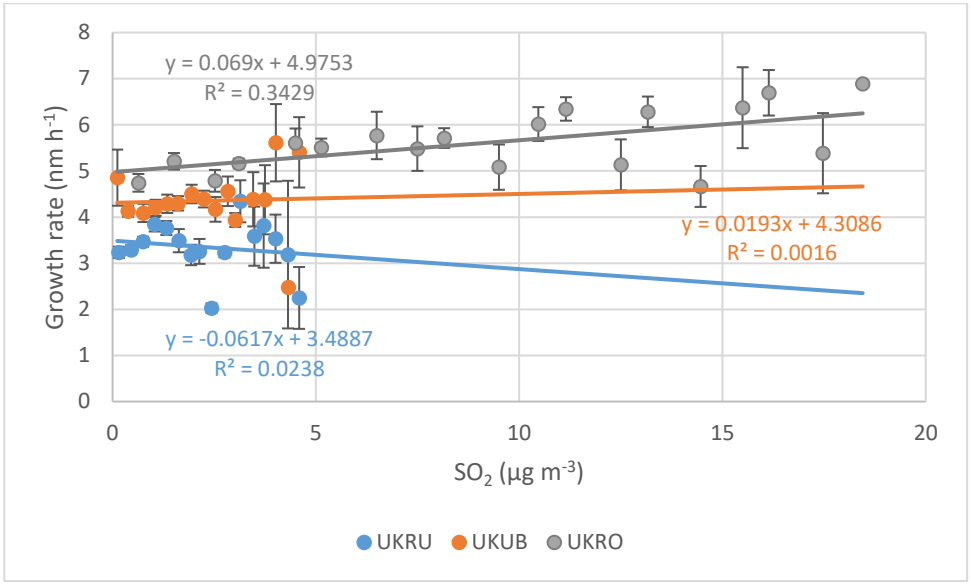
278

279



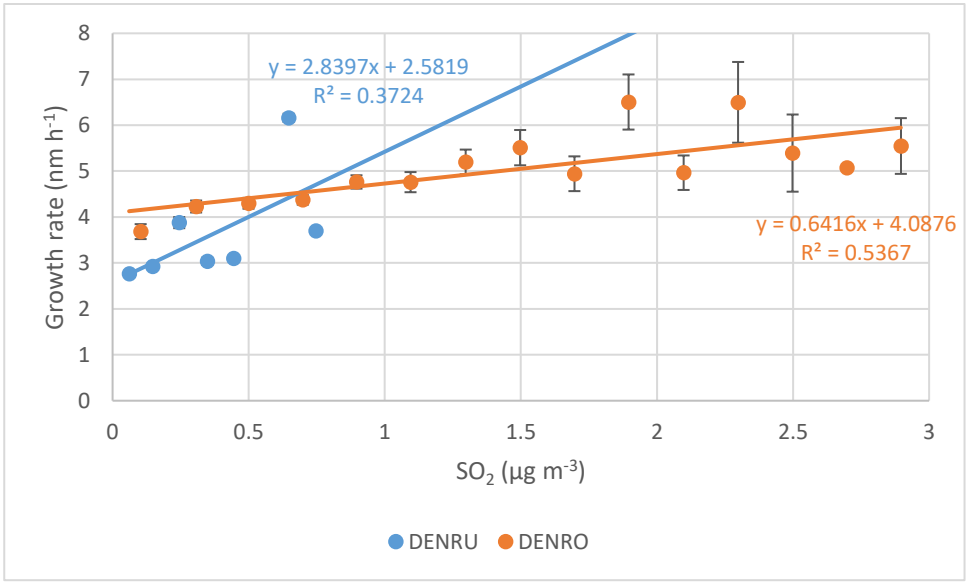
280

281



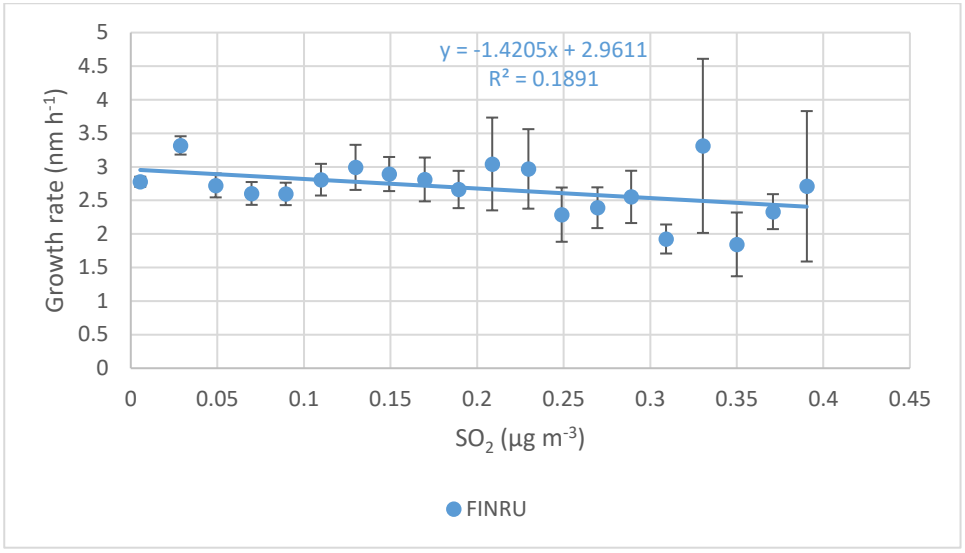
282

283



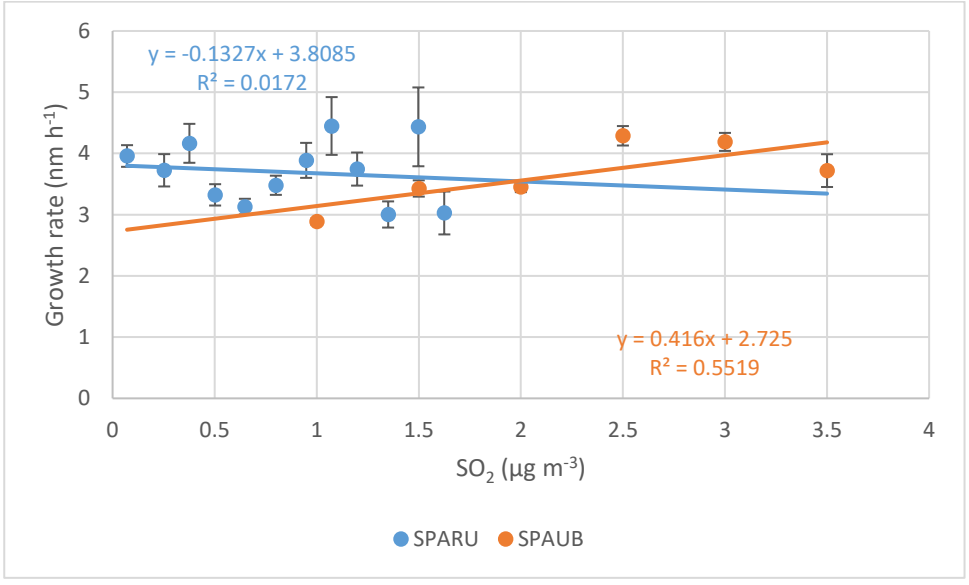
284

285



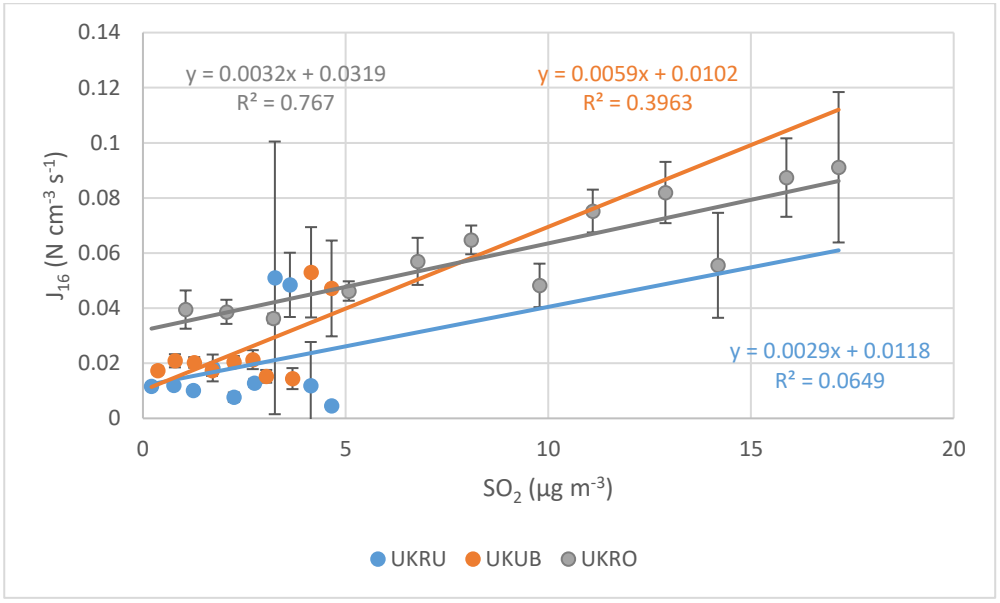
286

287



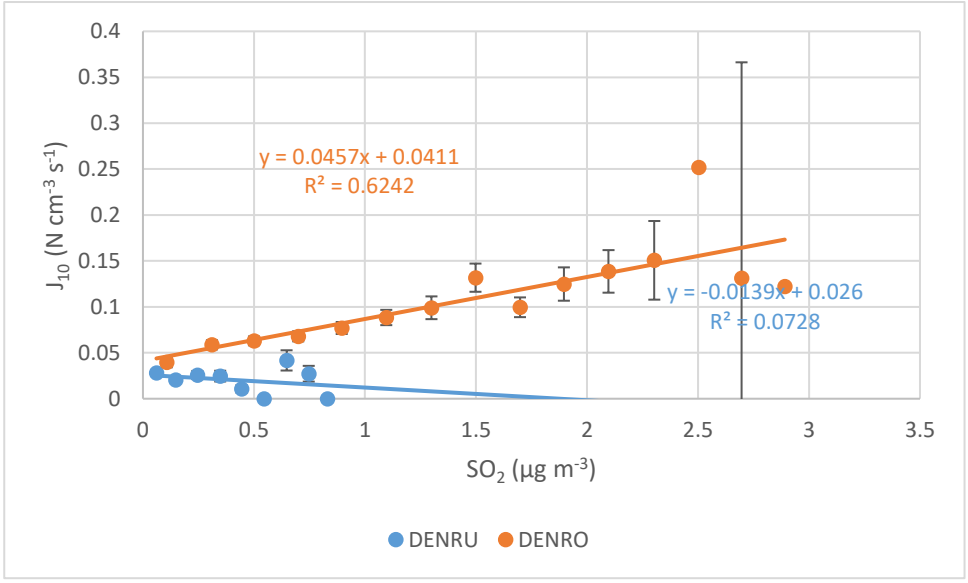
288

289



290

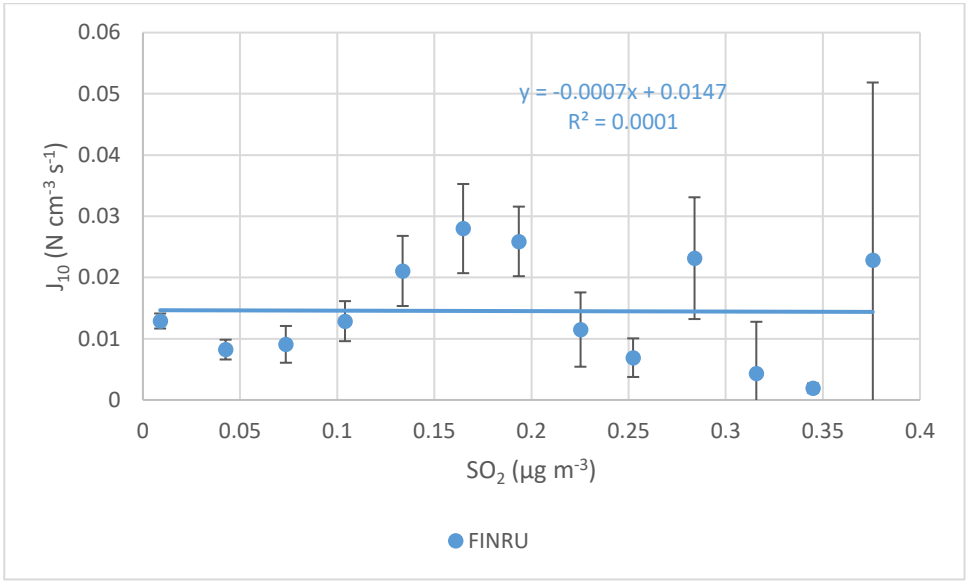
291



292

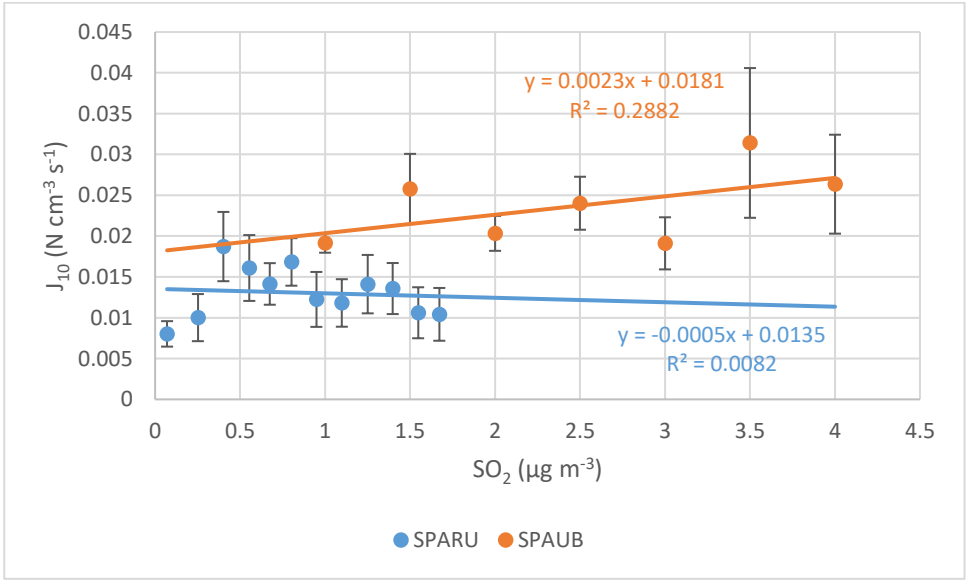
293

294



295

296



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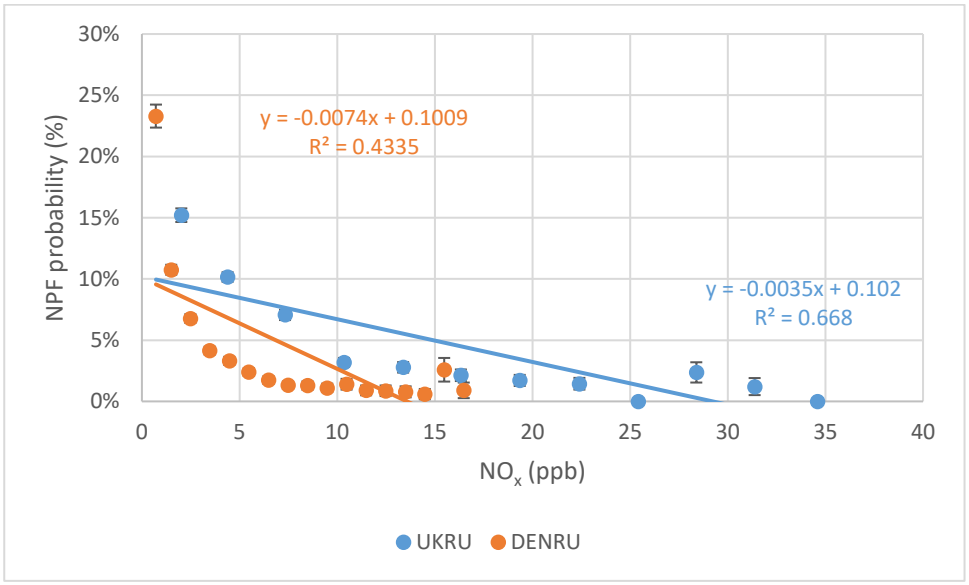
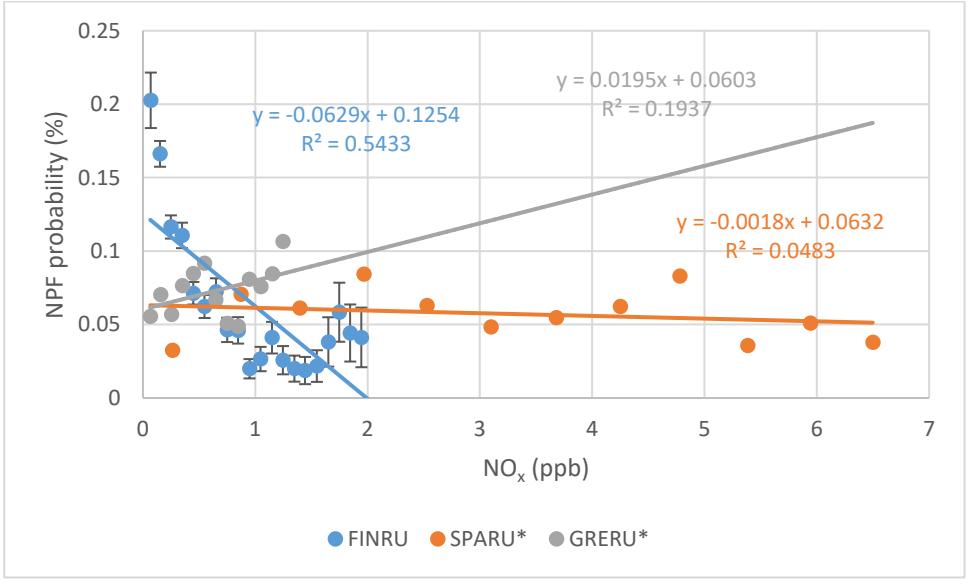
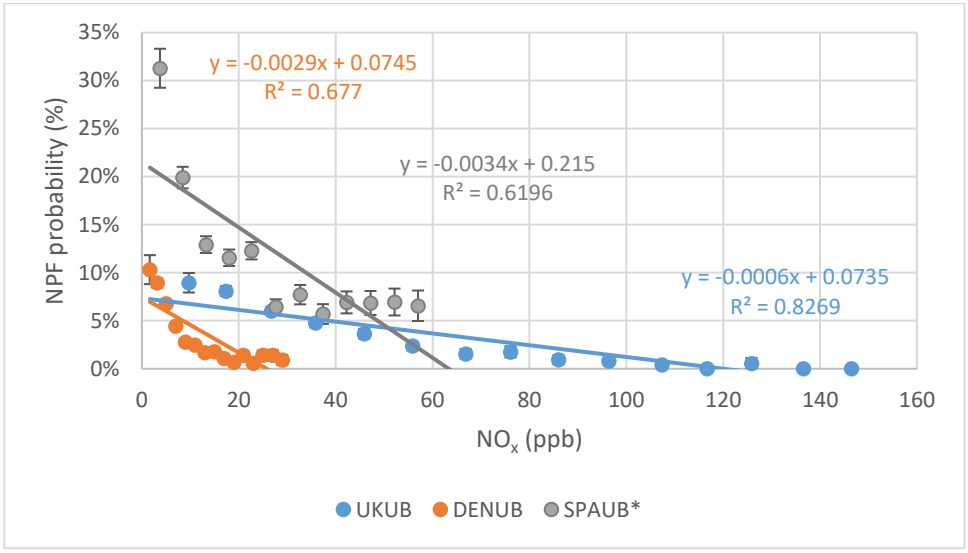
300





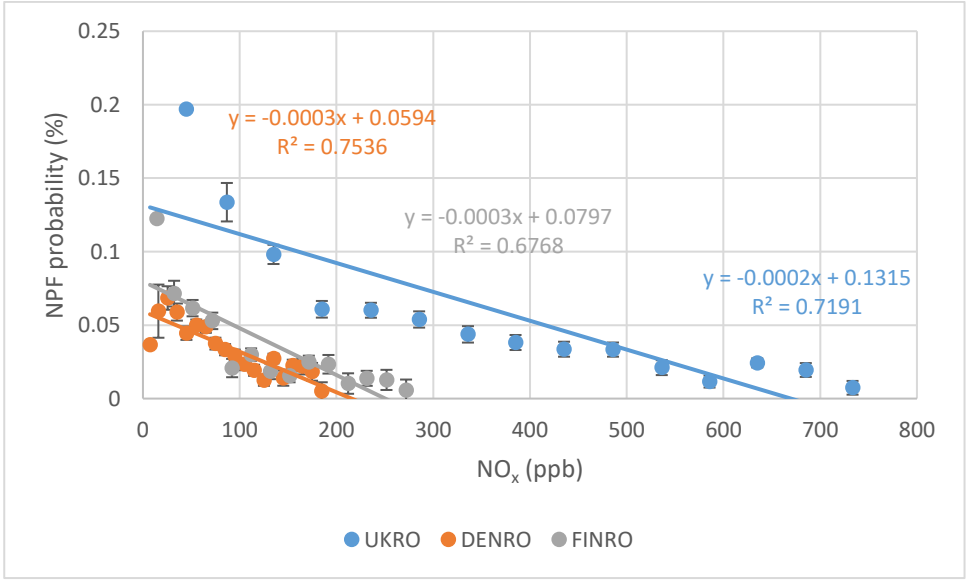
***NO_2 for SPARU and GRERU**



308

309 ***NO_2 for SPAUB**

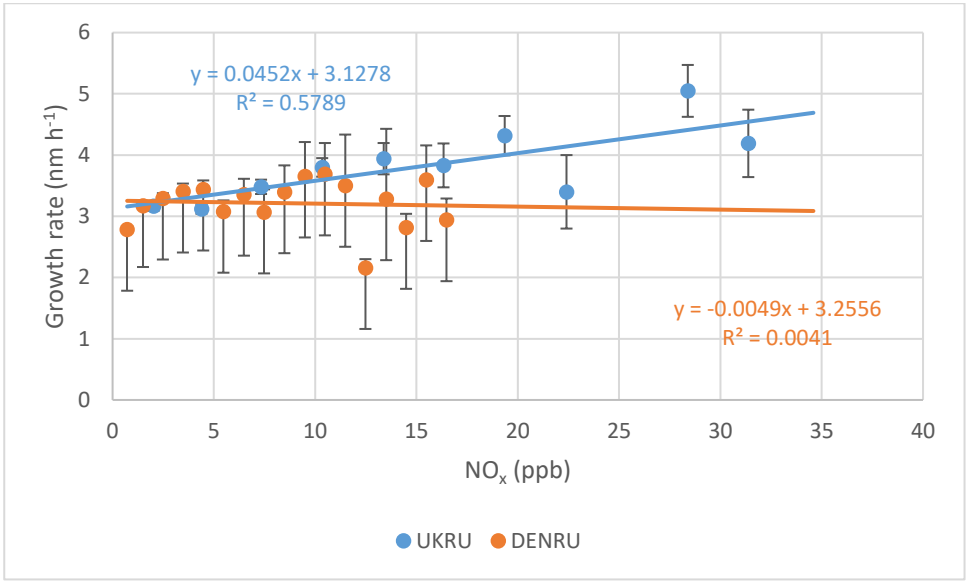
310

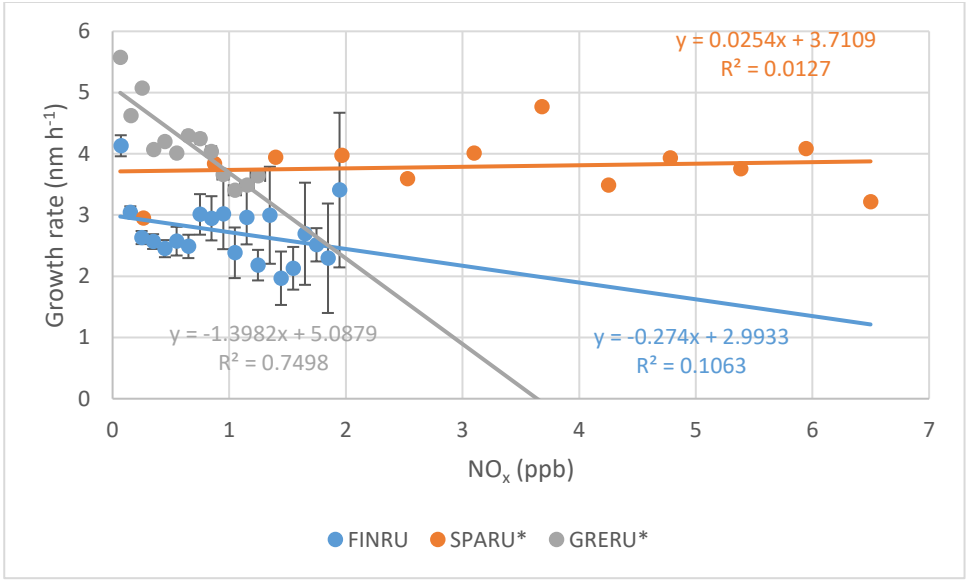


311

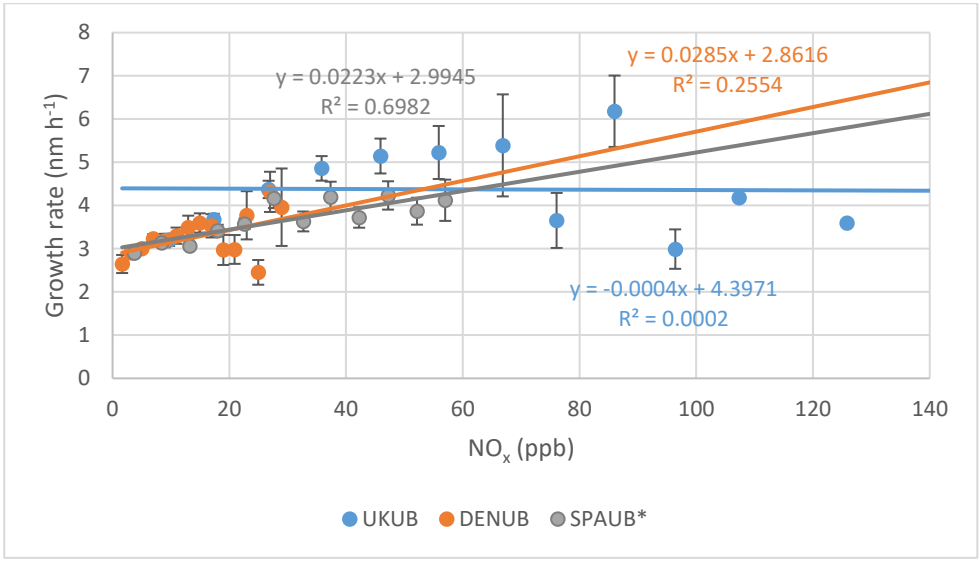
312

313





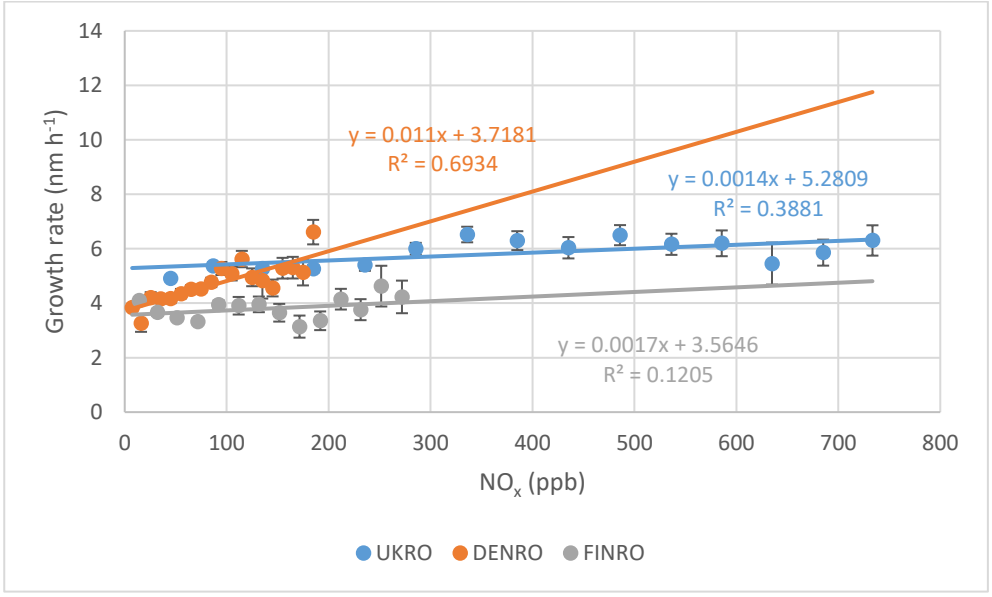
***NO_2 for SPARU and GRERU**



321

322 ***NO_2 for SPAUB**

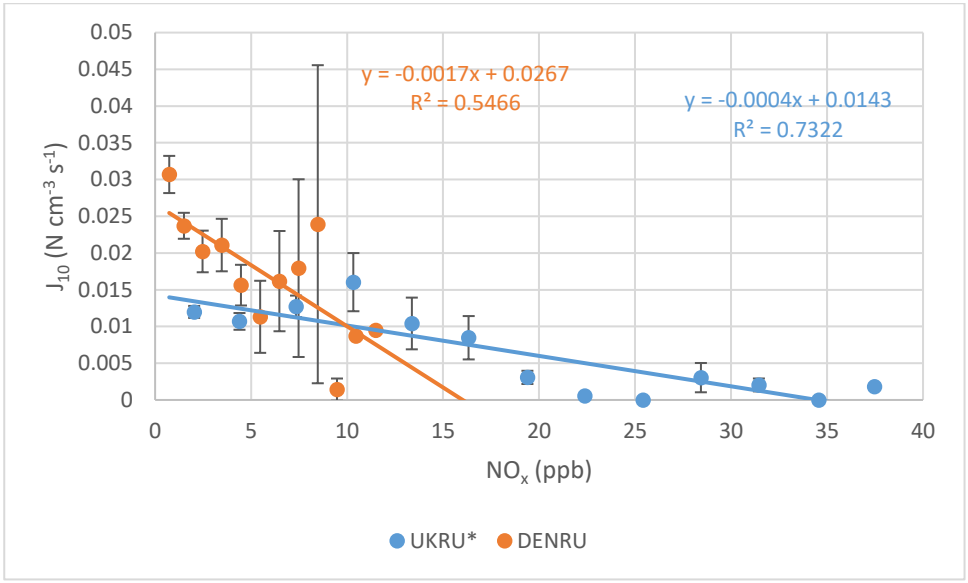
323



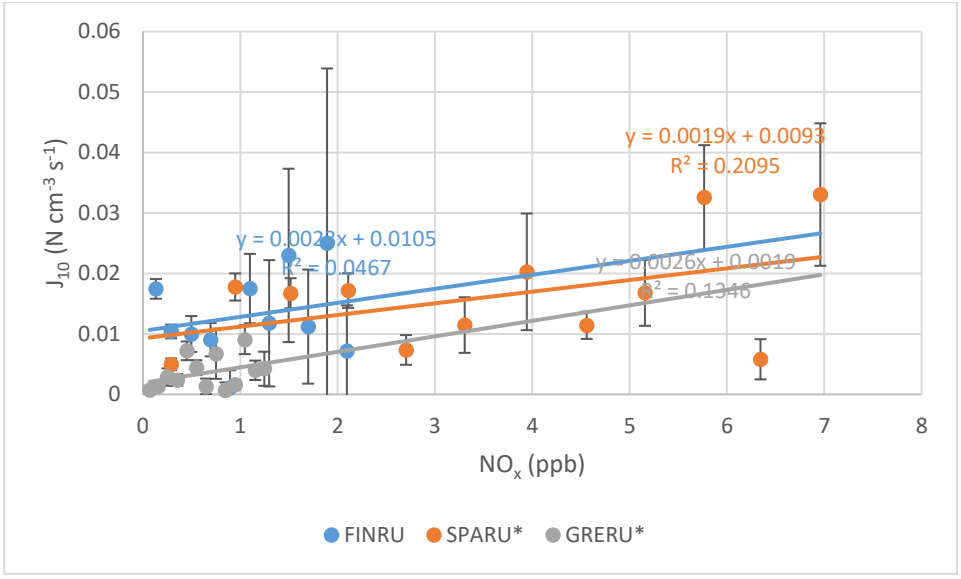
324

325

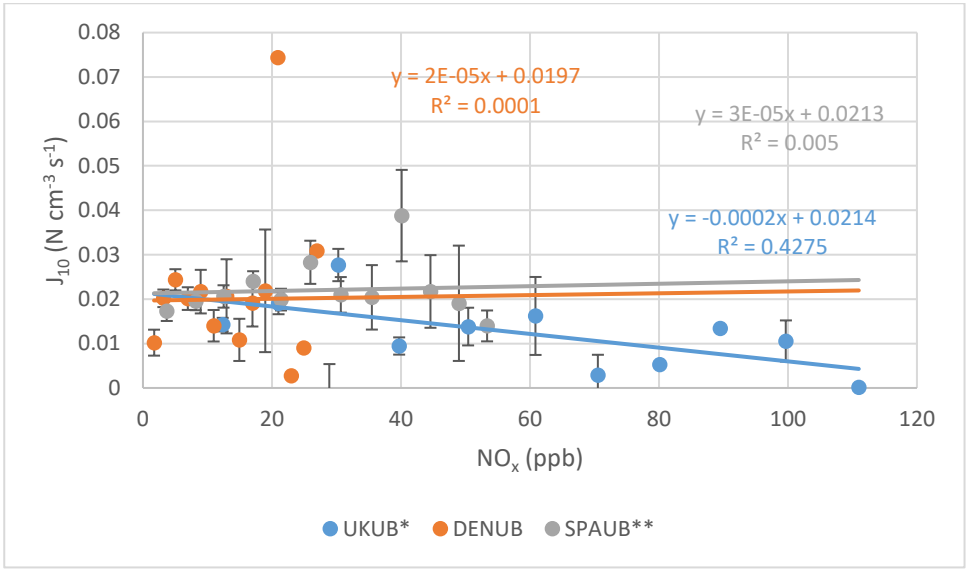
326



***J_{16} for UKRU**



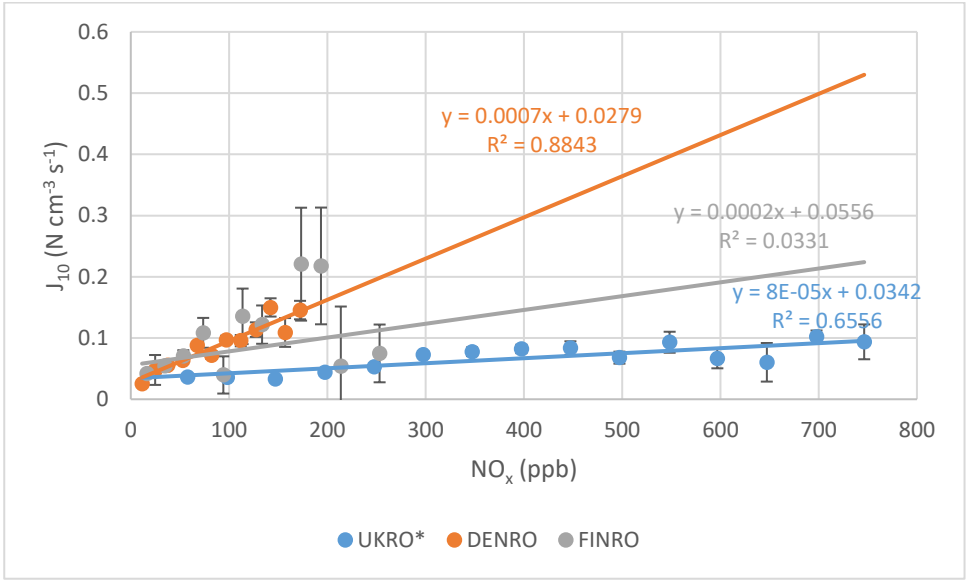
***NO_2 for SPARU and GRERU**



333

334 ***J_{16} for UKUB**

335 **** NO_2 for SPAUB**

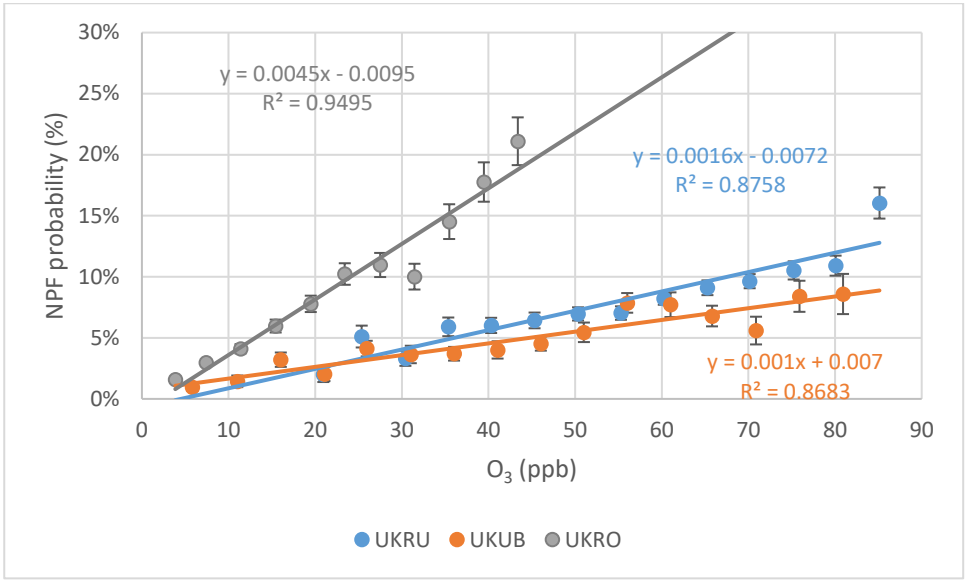


336

337

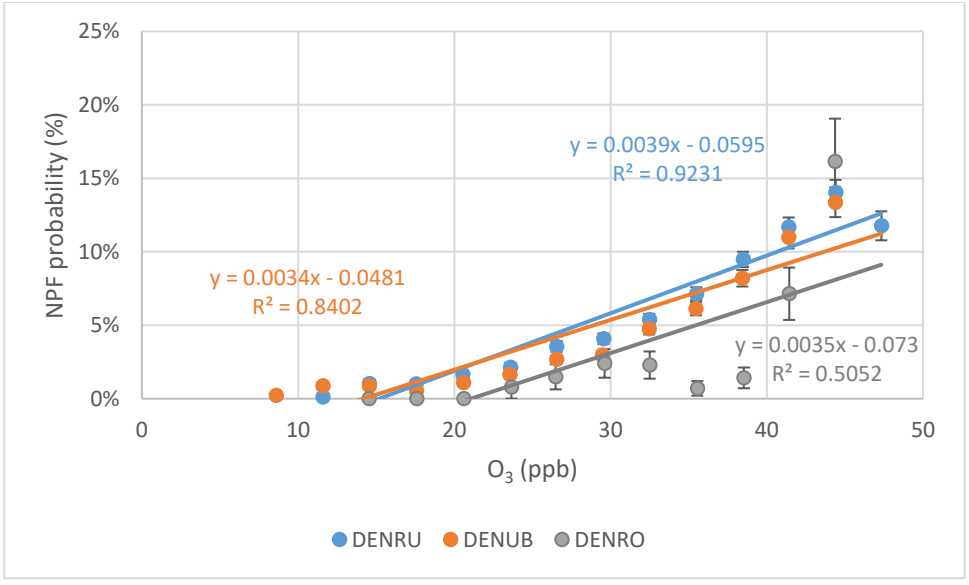
338 ***J_{16} for UKRO**

339



340

341



342

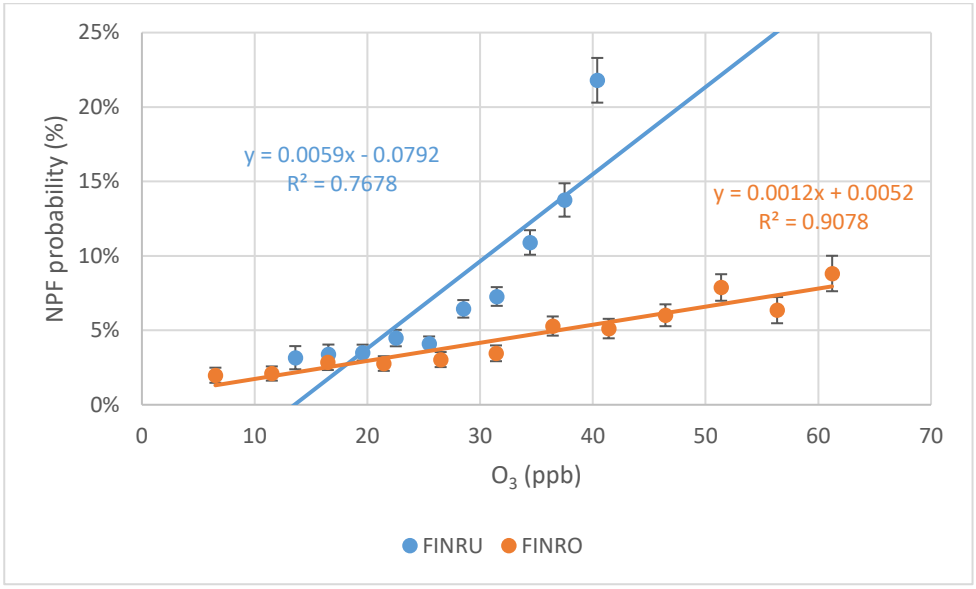
343

344

345

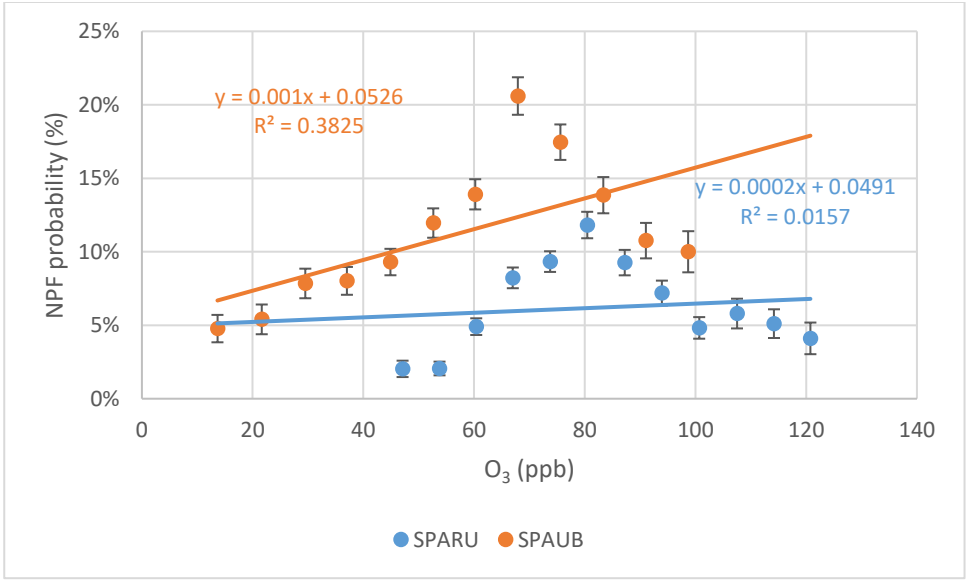
346

347



348

349

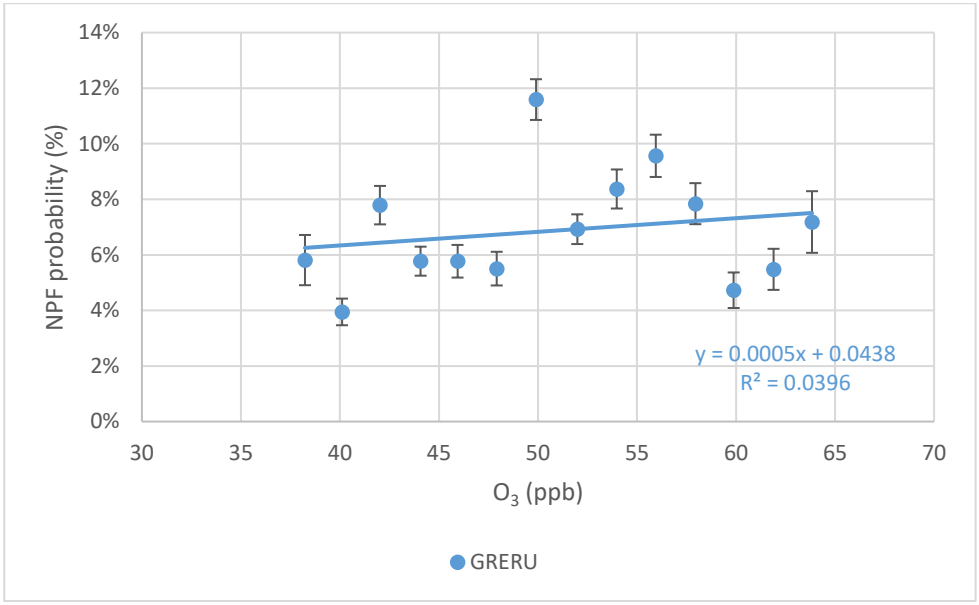


350

351

352

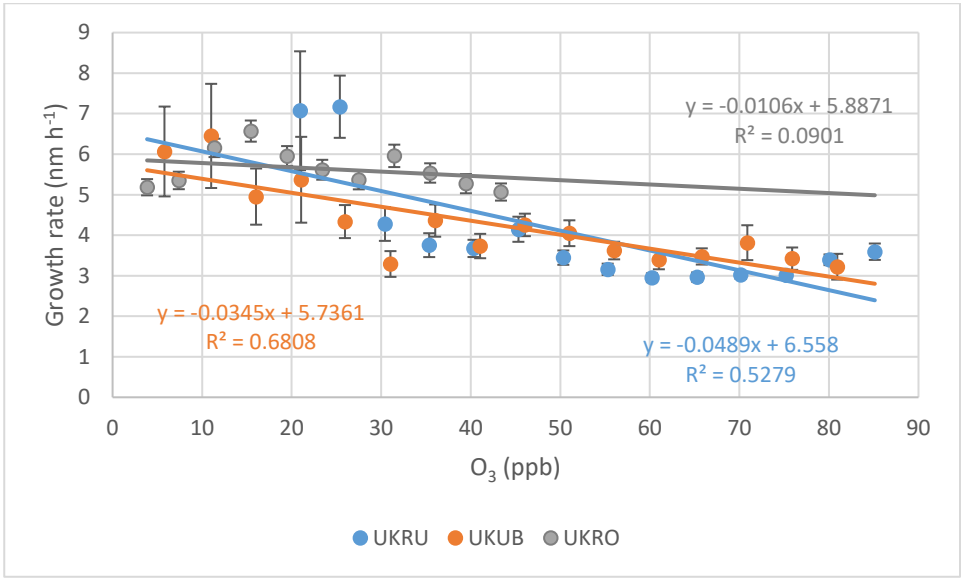
353


14%
12%
10%
8%
6%
4%
2%
0%
NPF probability (%)
30
35
40
45
50
55
60
65
70
O3 (ppb)
y = 0.0005x + 0.0438
R² = 0.0396
GRERU

354

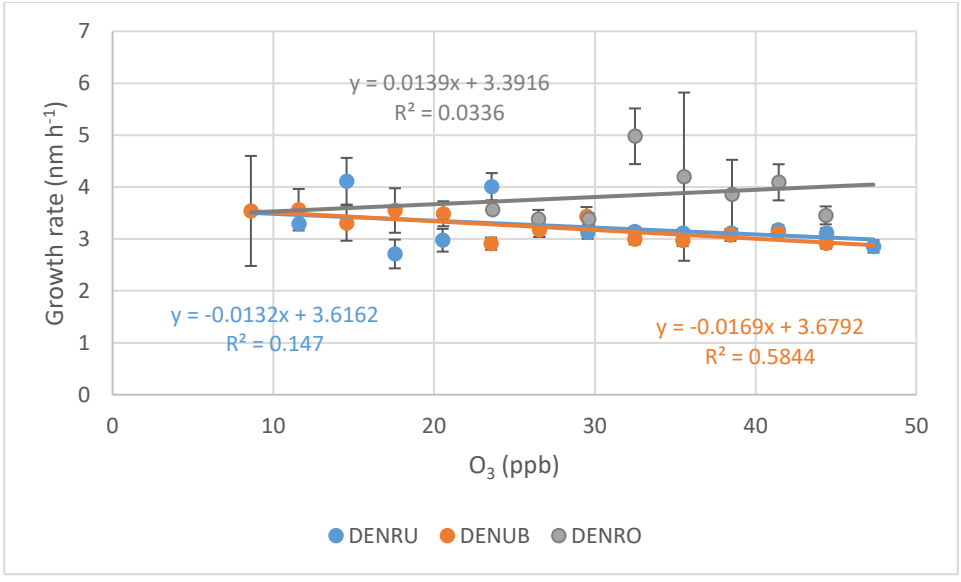
355

356



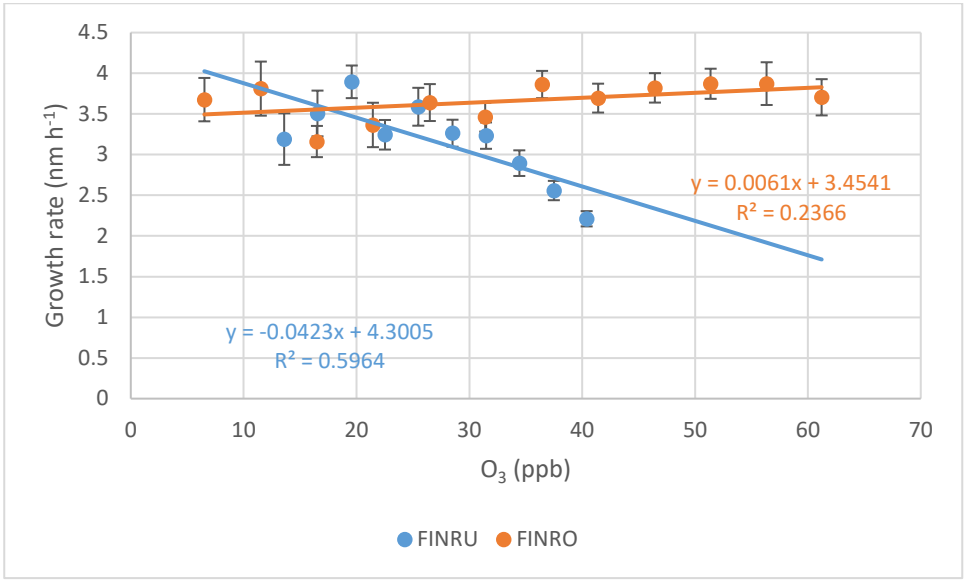
357

358



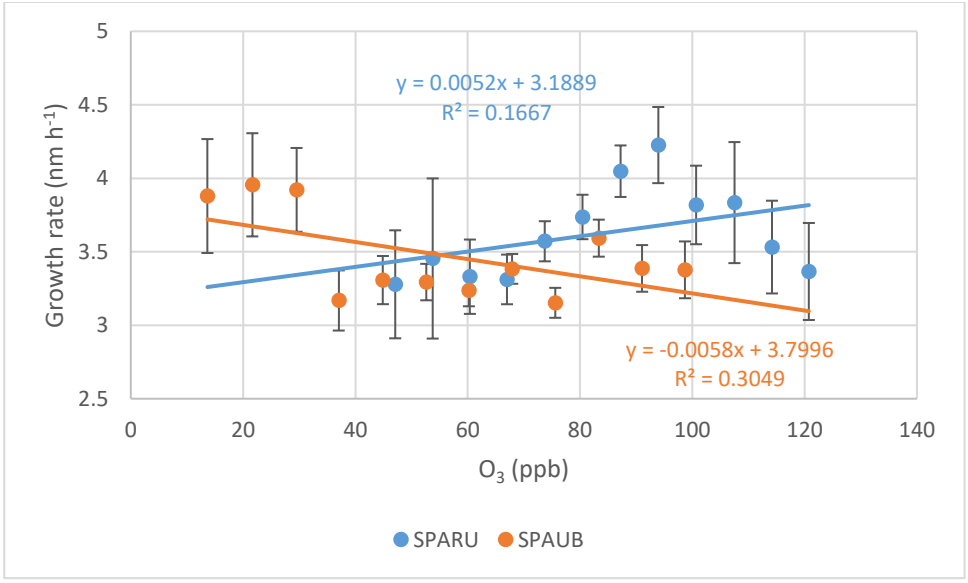
359

360



361

362

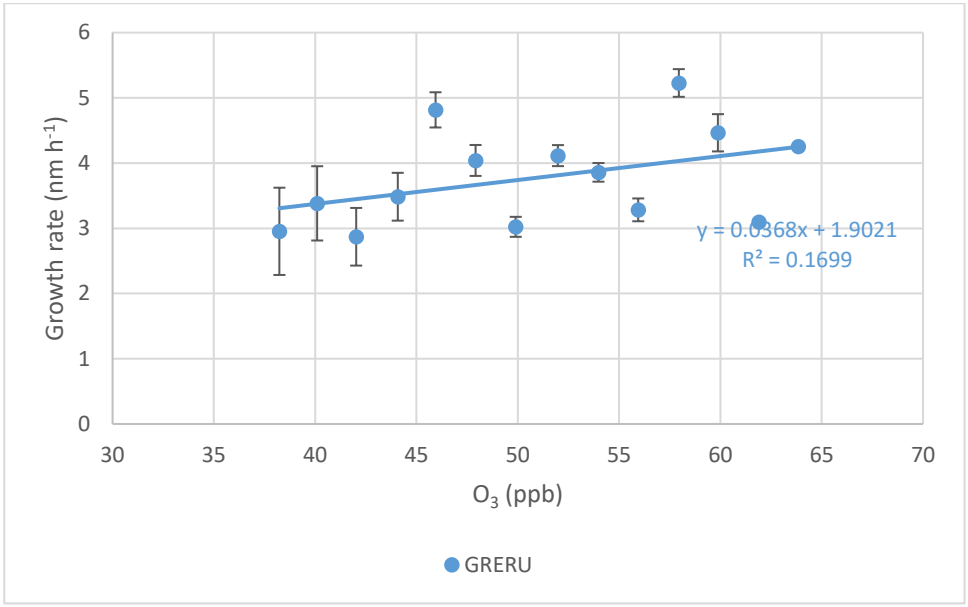


363

364

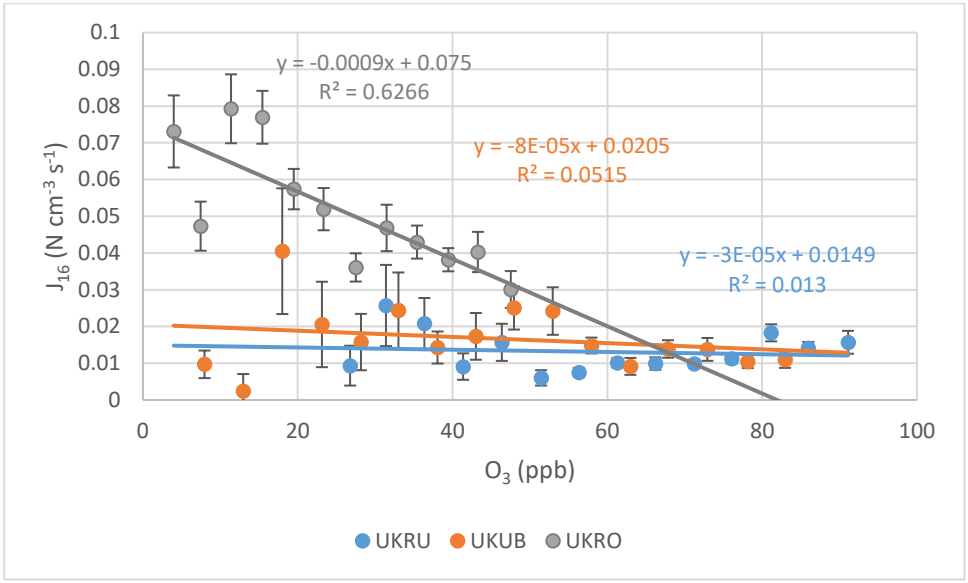
365

366


Growth rate (nm h-1)
6
5
4
3
2
1
0
30
35
40
45
50
55
60
65
70
O3 (ppb)
y = 0.0368x + 1.9021
R² = 0.1699
GRERU

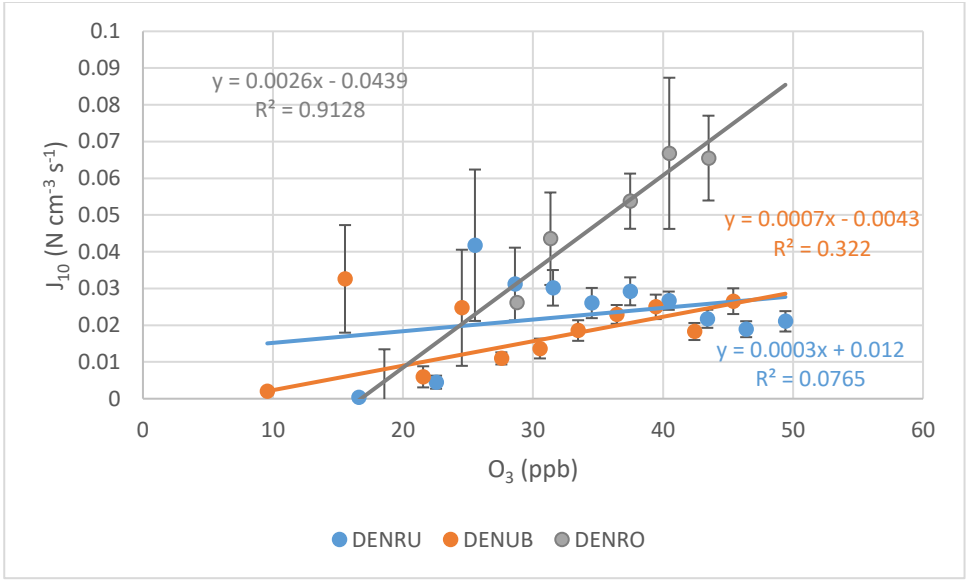
367

368



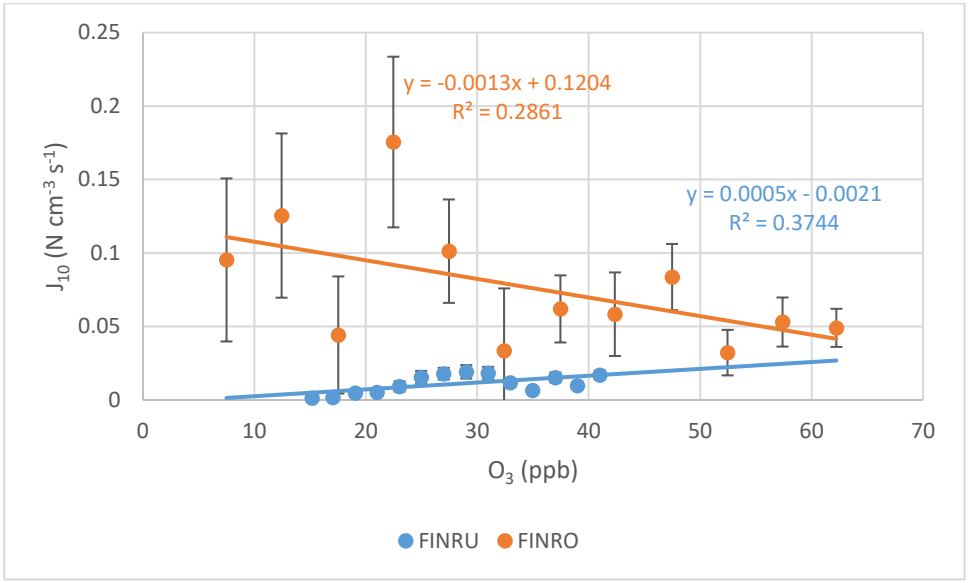
369

370



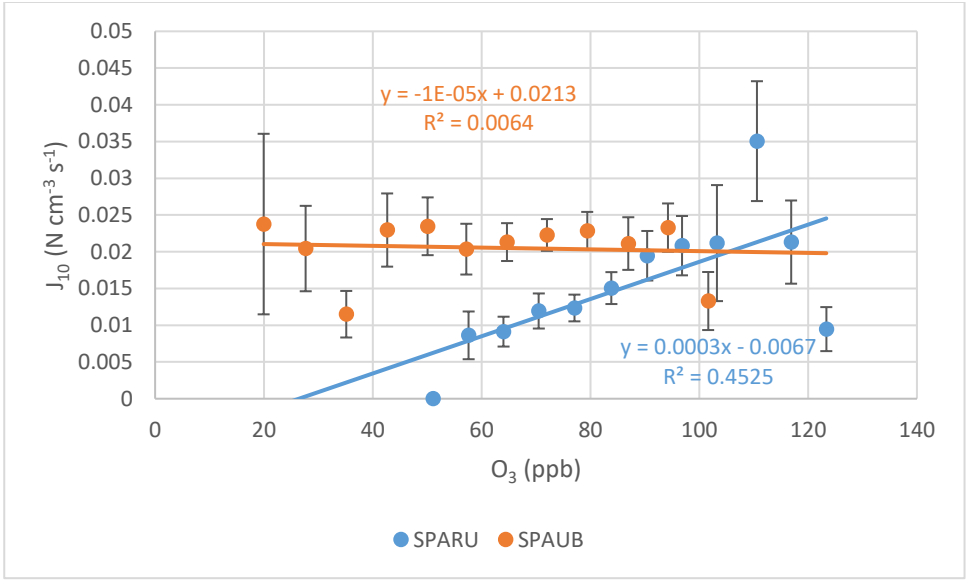
371

372



373

374

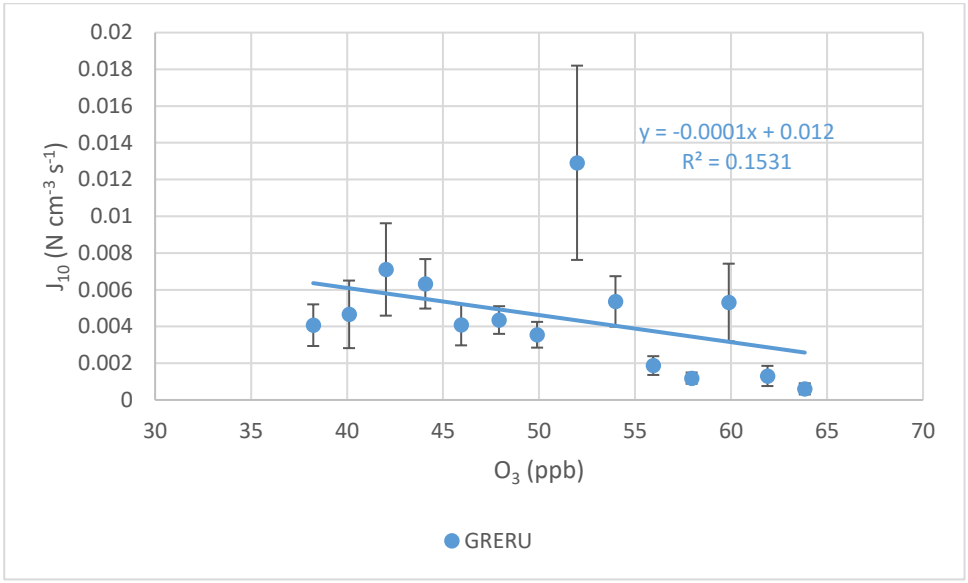


375

376

377

378

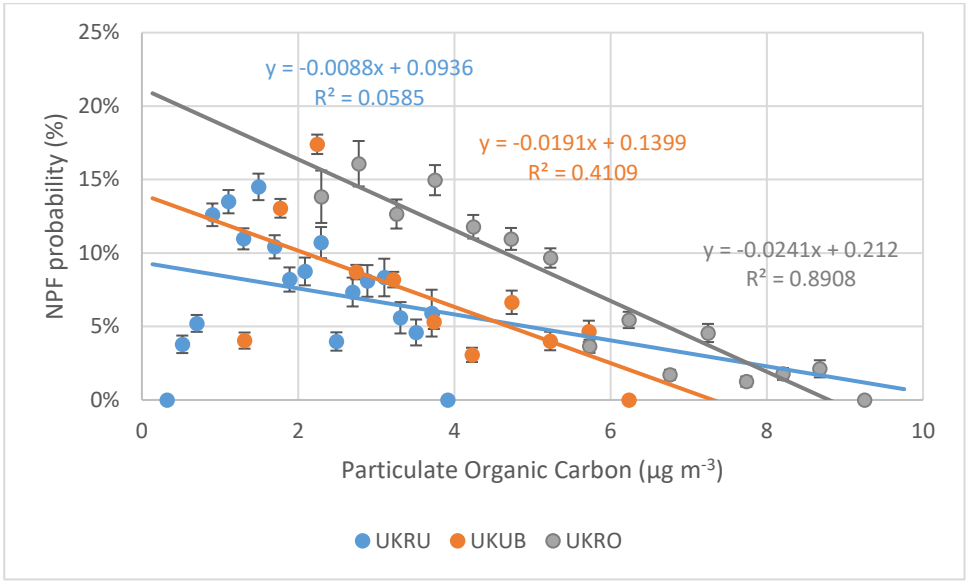


379

380

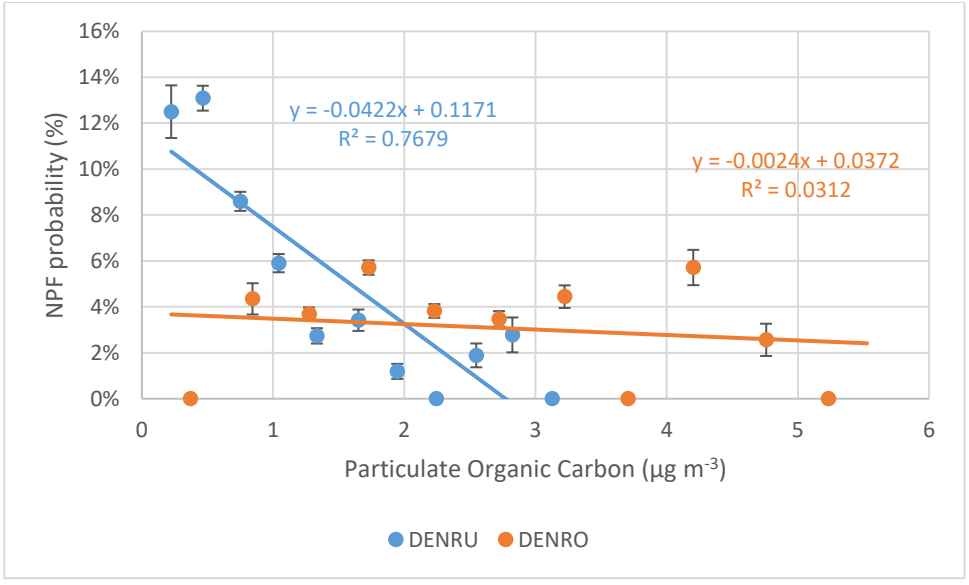
381

382



383

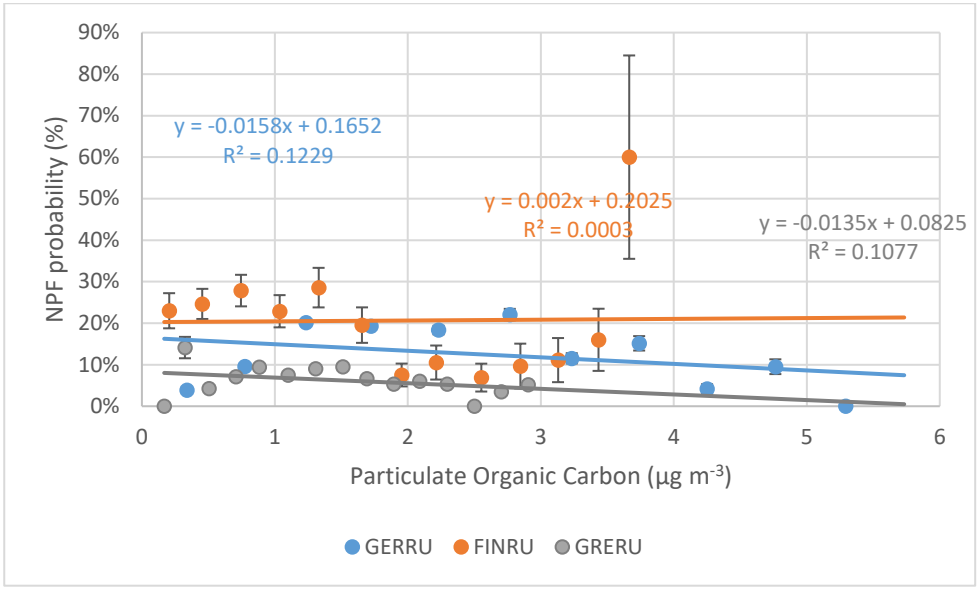
384



385

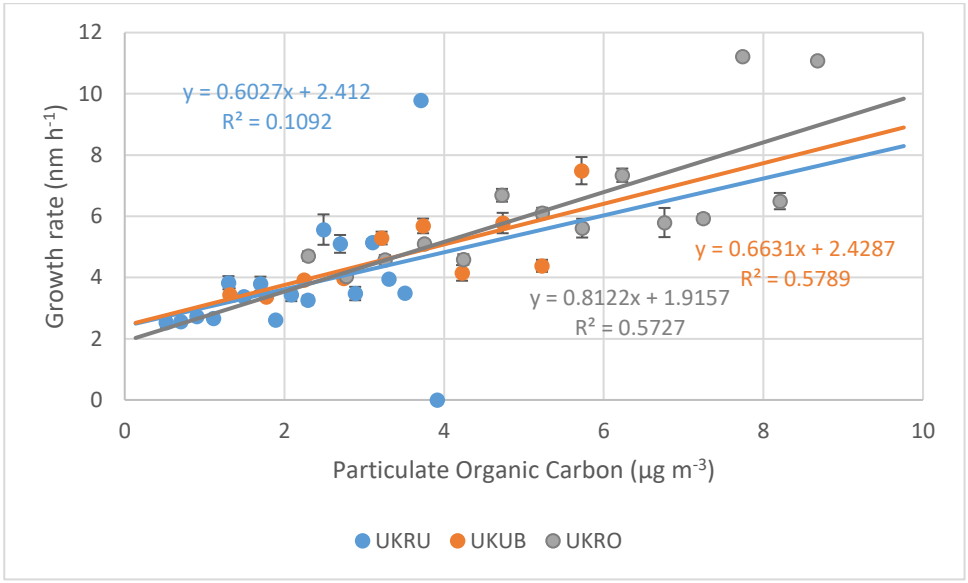
386

387


90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
NPF probability (%)
y = -0.0158x + 0.1652
R² = 0.1229
y = 0.002x + 0.2025
R² = 0.0003
y = -0.0135x + 0.0825
R² = 0.1077
0
1
2
3
4
5
6
Particulate Organic Carbon (µg m-3)
GERRU
FINRU
GRERU

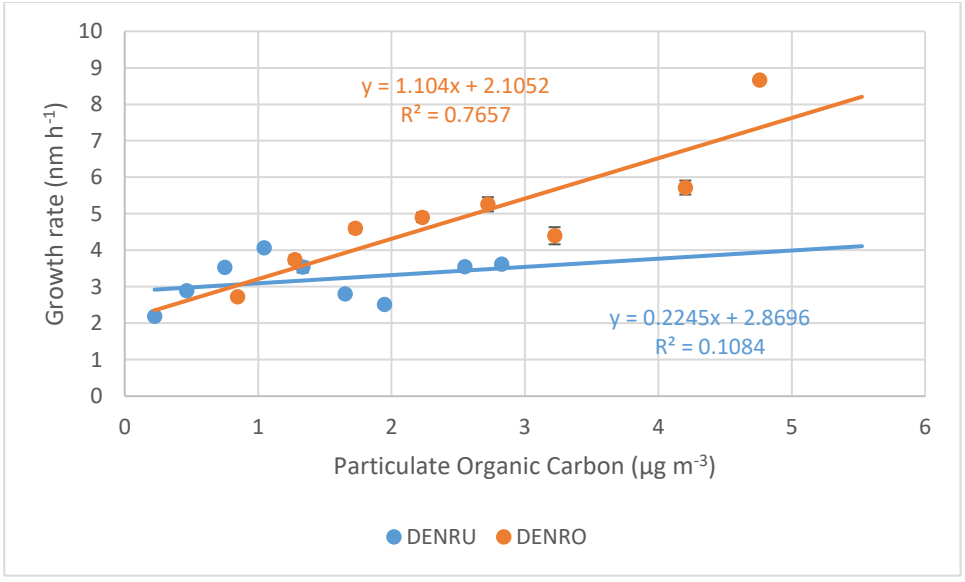
388

389



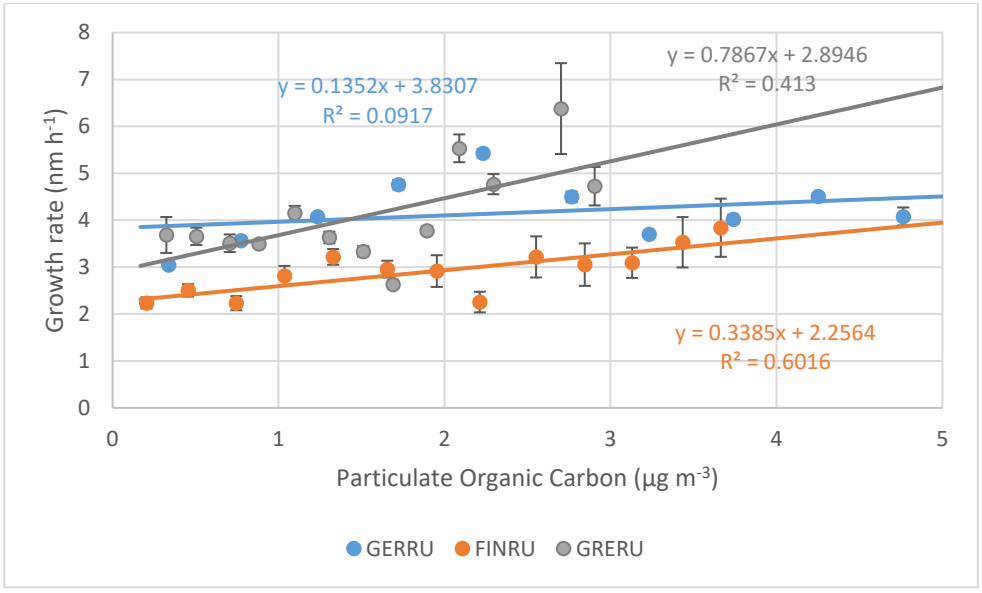
390

391



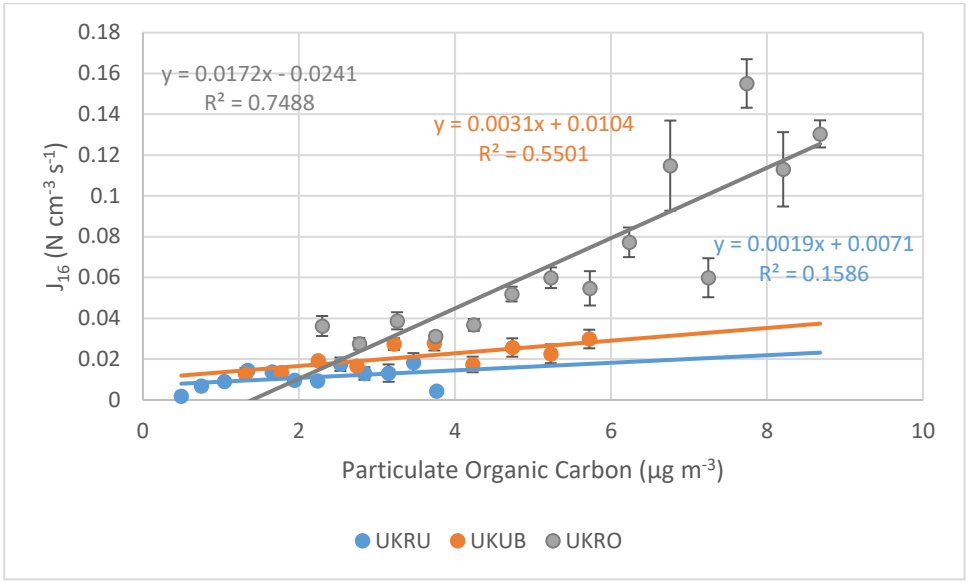
392

393


y = 0.1352x + 3.8307
R² = 0.0917
y = 0.7867x + 2.8946
R² = 0.413
y = 0.3385x + 2.2564
R² = 0.6016
Growth rate (nm h-1)
Particulate Organic Carbon (µg m-3)
0
1
2
3
4
5
6
7
8
GERRU
FINRU
GRERU

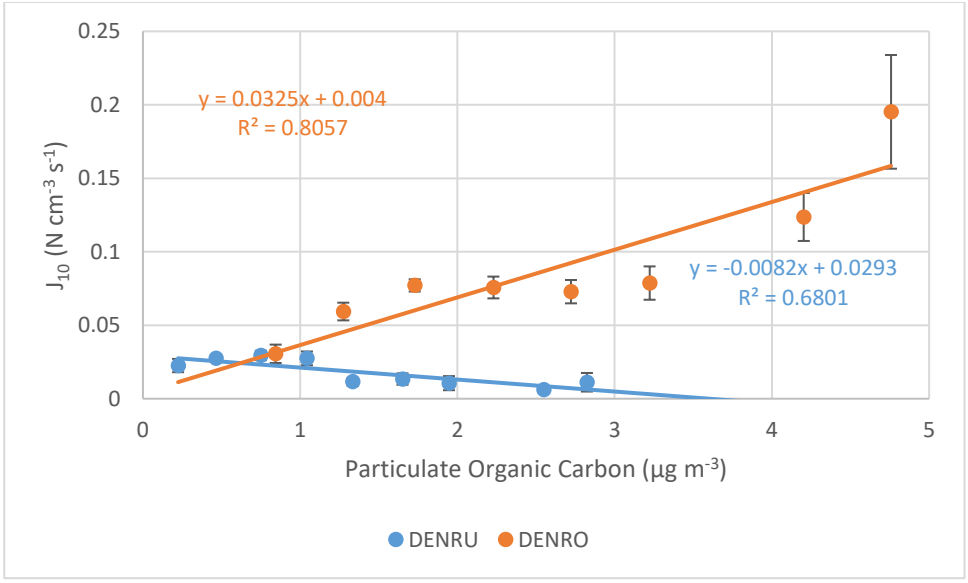
394

395



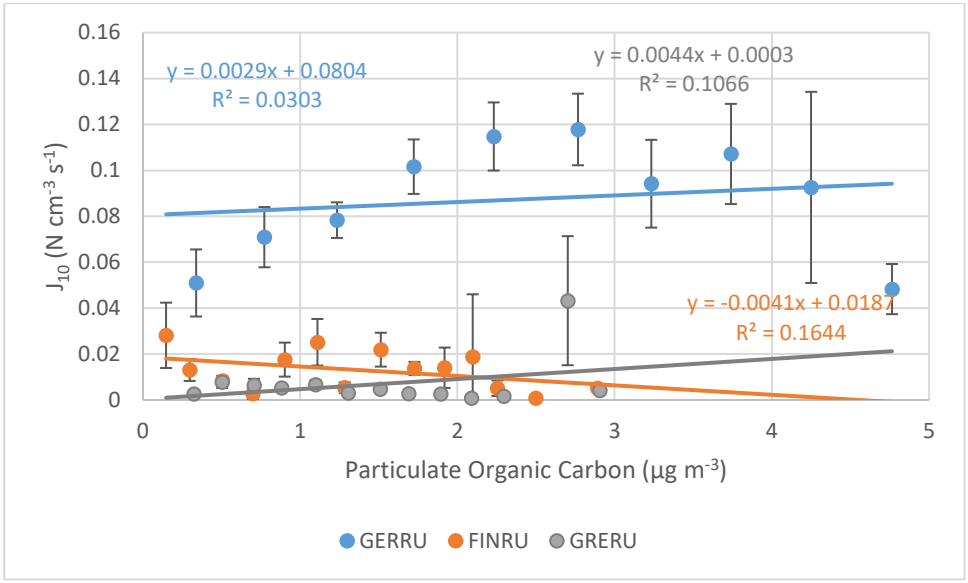
396

397



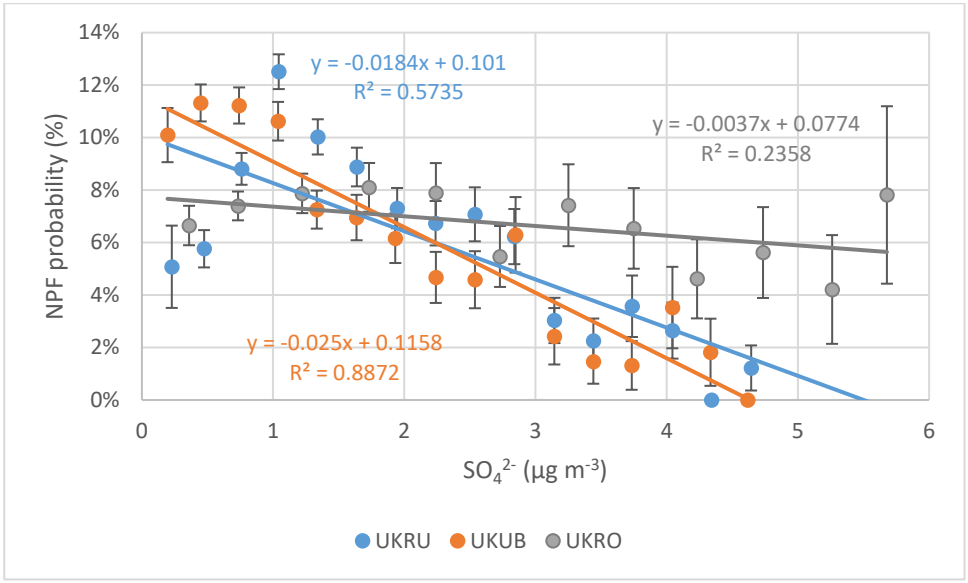
398

399


y = 0.0029x + 0.0804
R² = 0.0303
y = 0.0044x + 0.0003
R² = 0.1066
y = -0.0041x + 0.0187
R² = 0.1644
J10 (N cm-3 s-1)
Particulate Organic Carbon (µg m-3)
GERRU
FINRU
GRERU

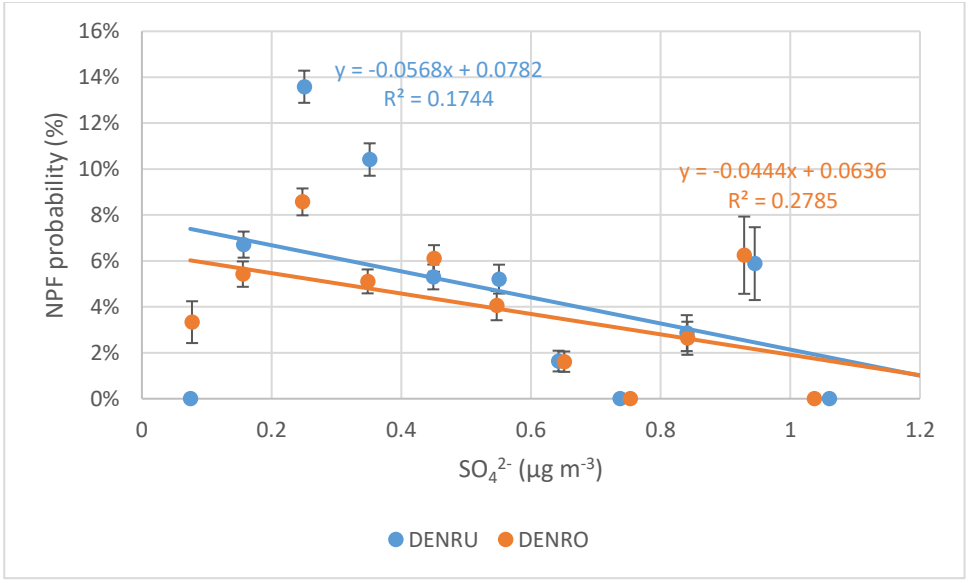
400

401



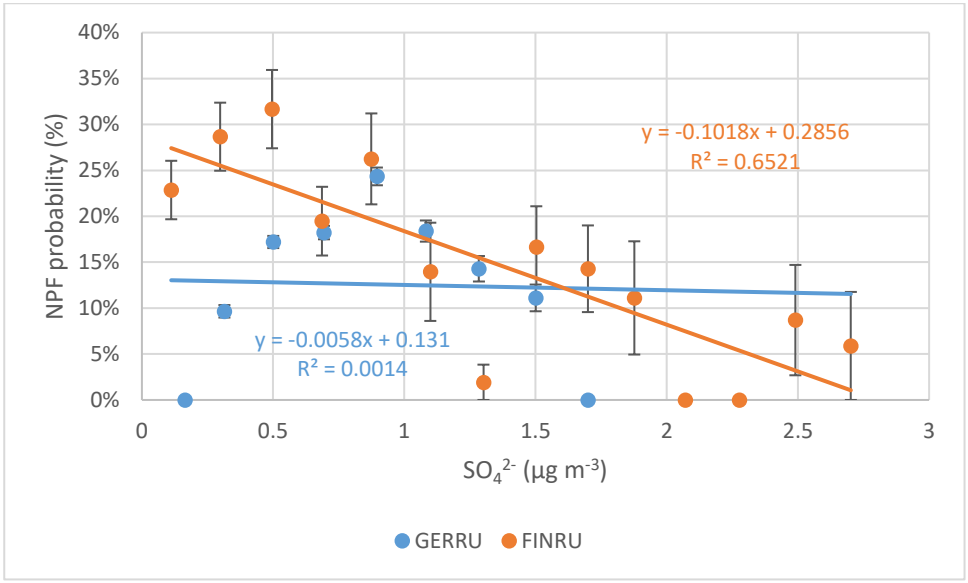
402

403



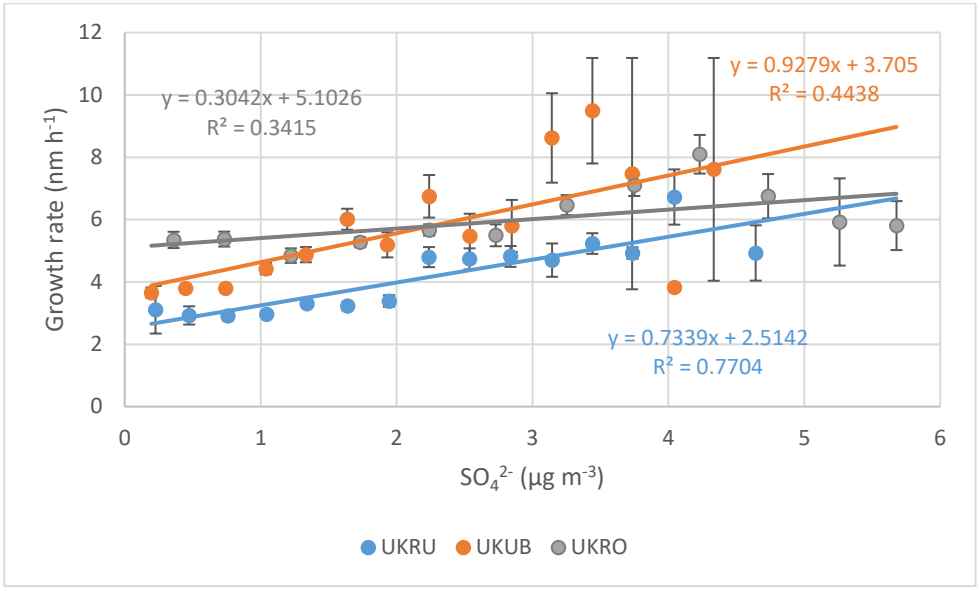
404

405


40%
35%
30%
25%
20%
15%
10%
5%
0%
NPF probability (%)
0
0.5
1
1.5
2
2.5
3
SO4 2- (µg m-3)
y = -0.1018x + 0.2856
R² = 0.6521
y = -0.0058x + 0.131
R² = 0.0014
GERRU
FINRU

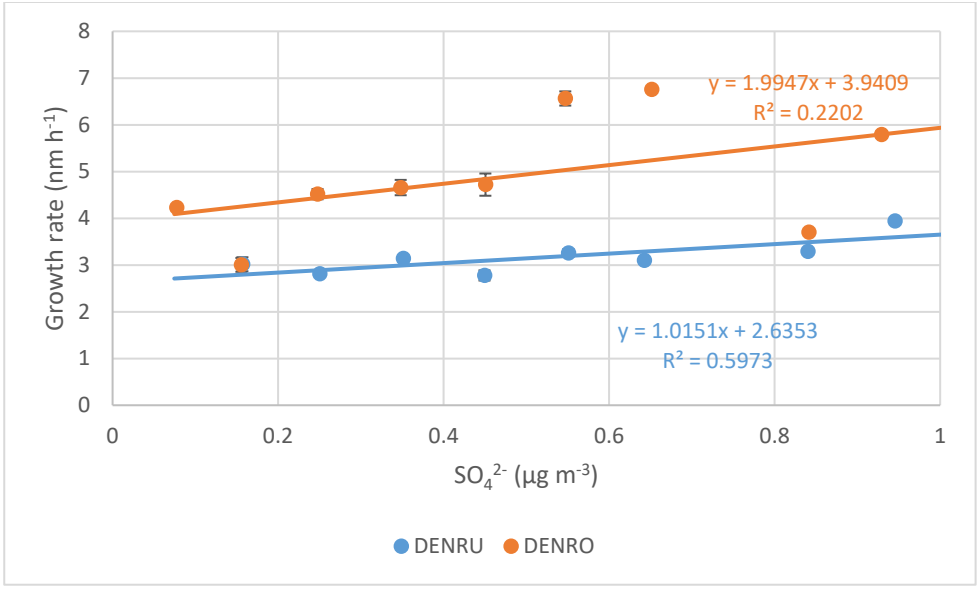
406

407



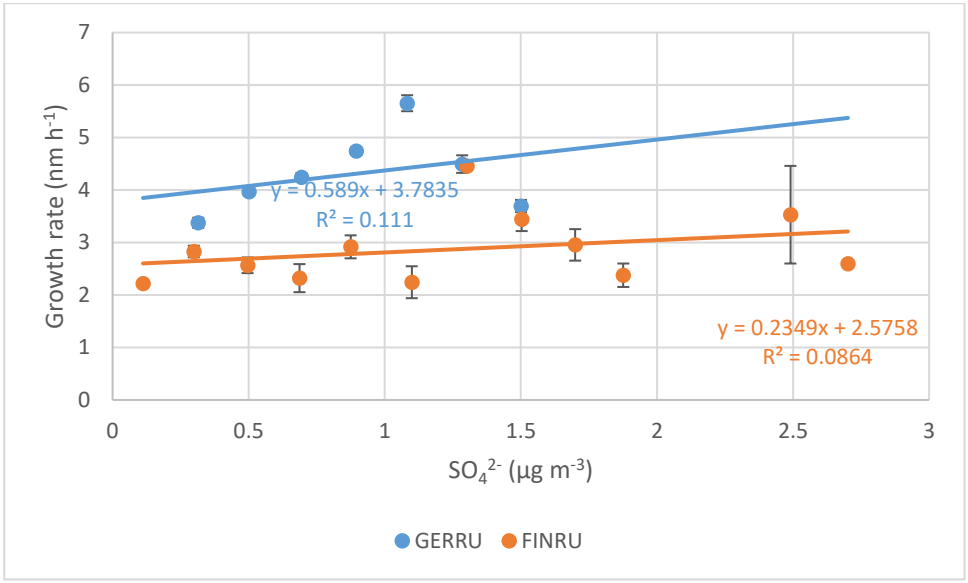
408

409



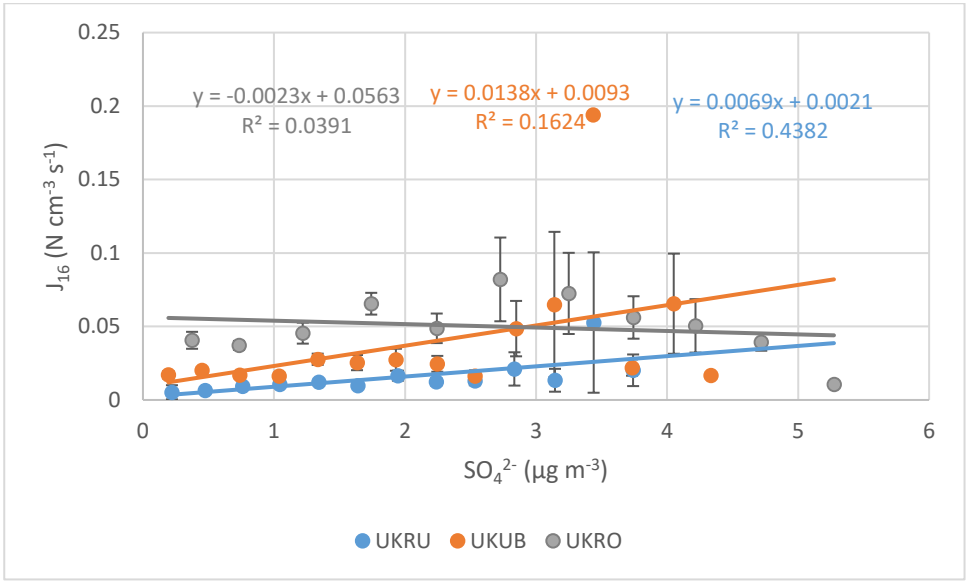
410

411


Growth rate (nm h-1)
7
6
5
4
3
2
1
0
0
0.5
1
1.5
2
2.5
3
SO4 2- (µg m-3)
y = 0.589x + 3.7835
R² = 0.111
y = 0.2349x + 2.5758
R² = 0.0864
GERRU
FINRU

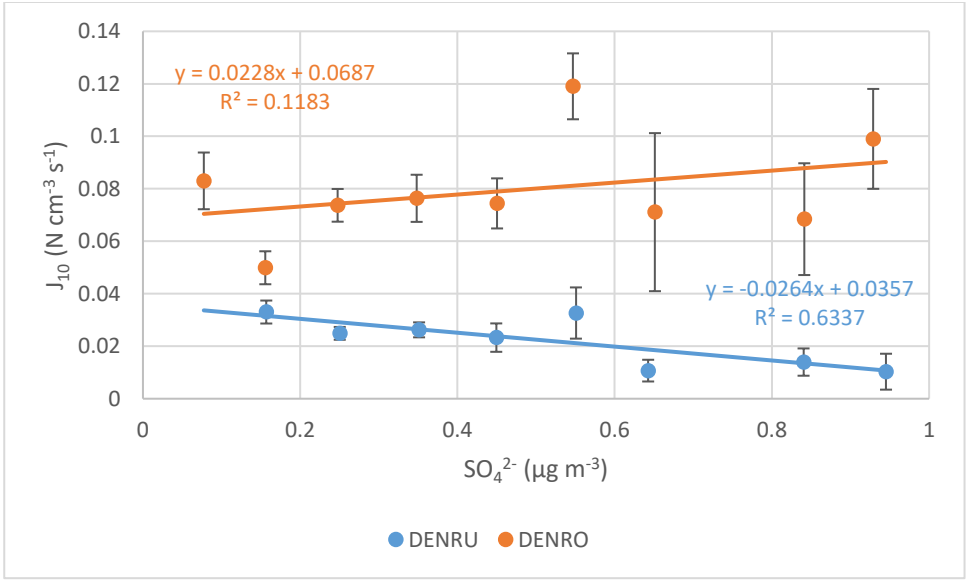
412

413



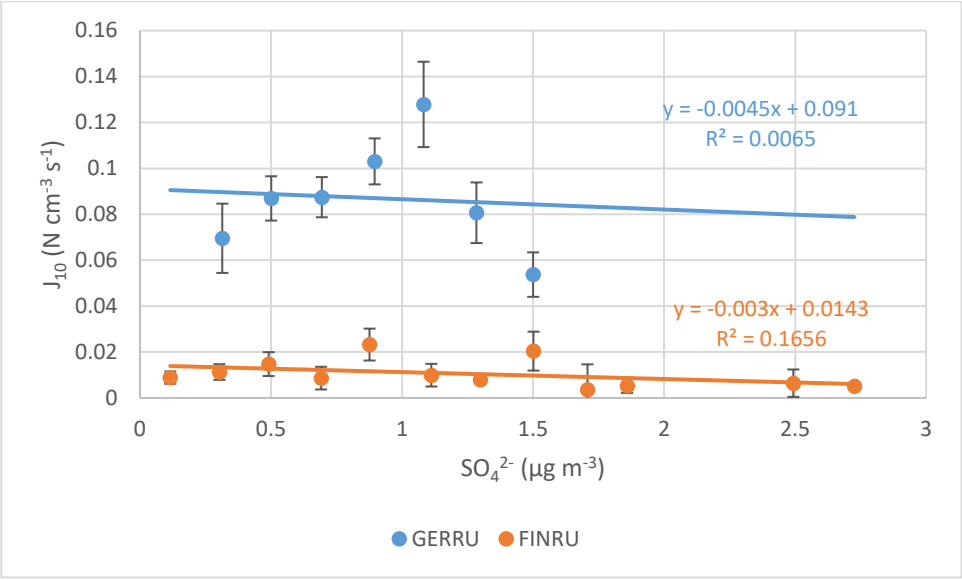
414

415



416

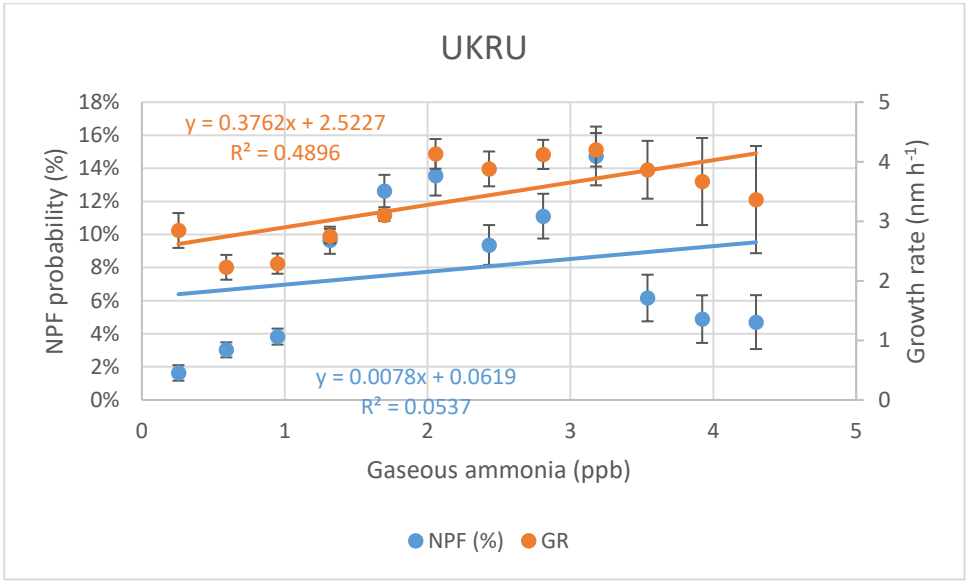
417


0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
0.5
1
1.5
2
2.5
3
J10 (N cm-3 s-1)
SO4 2- (µg m-3)
y = -0.0045x + 0.091
R² = 0.0065
y = -0.003x + 0.0143
R² = 0.1656
GERRU
FINRU

418

419

420



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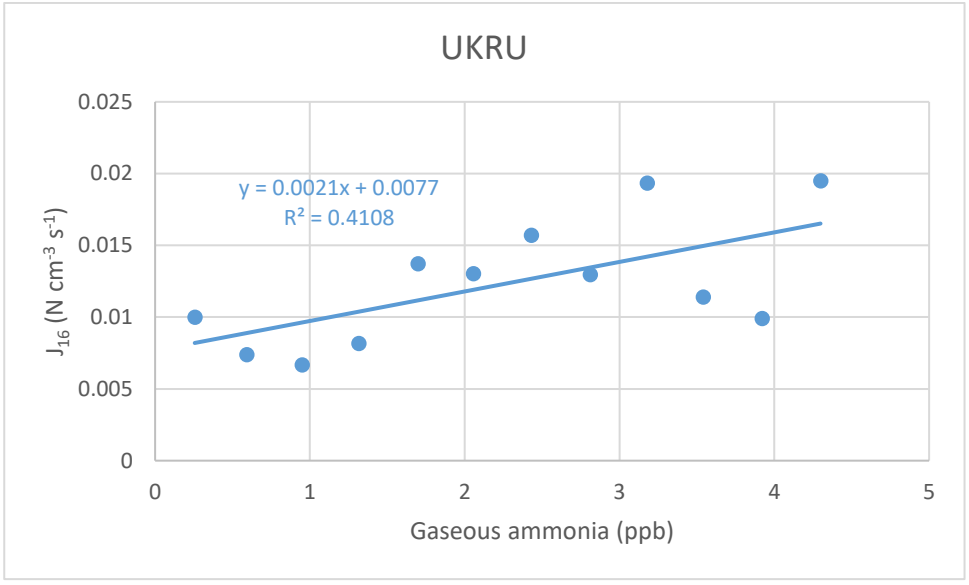

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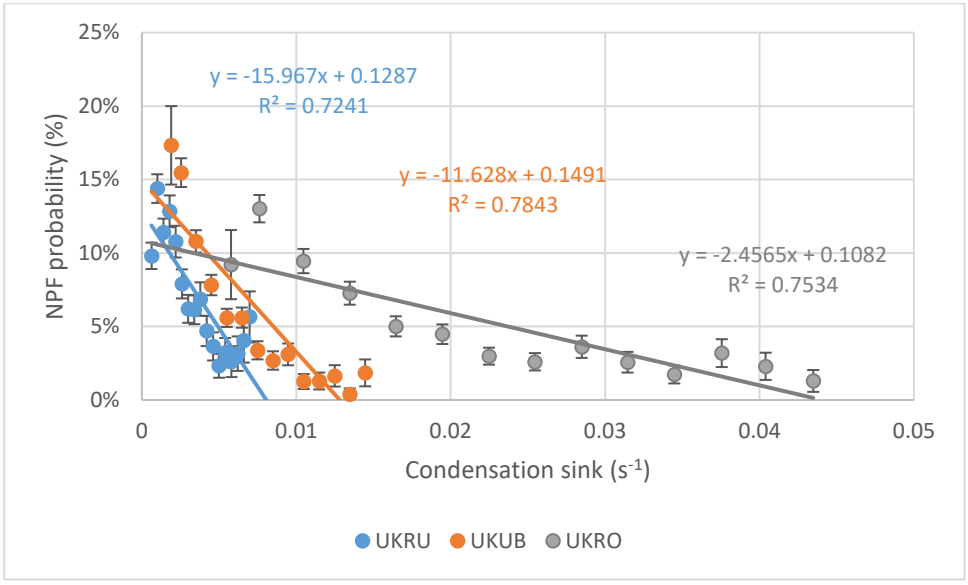

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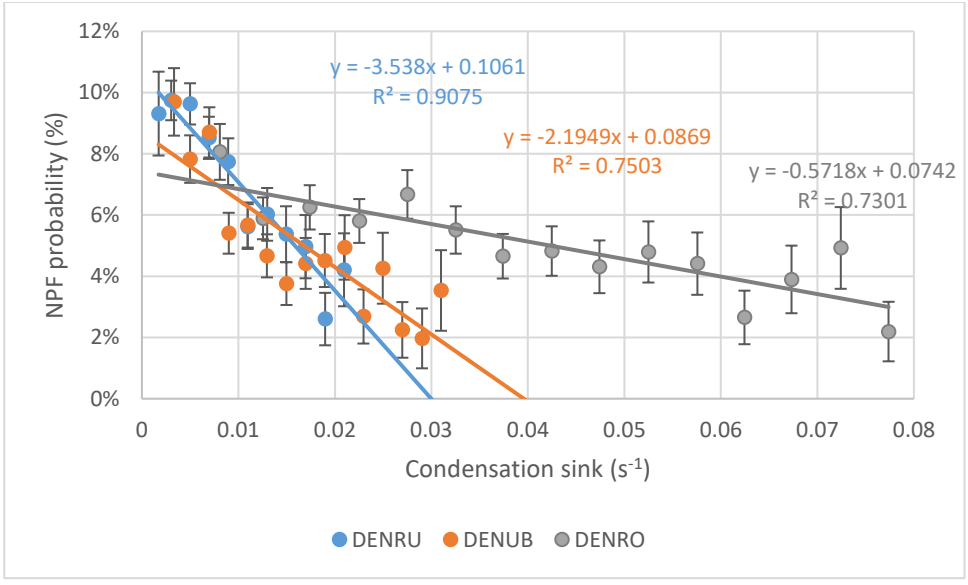

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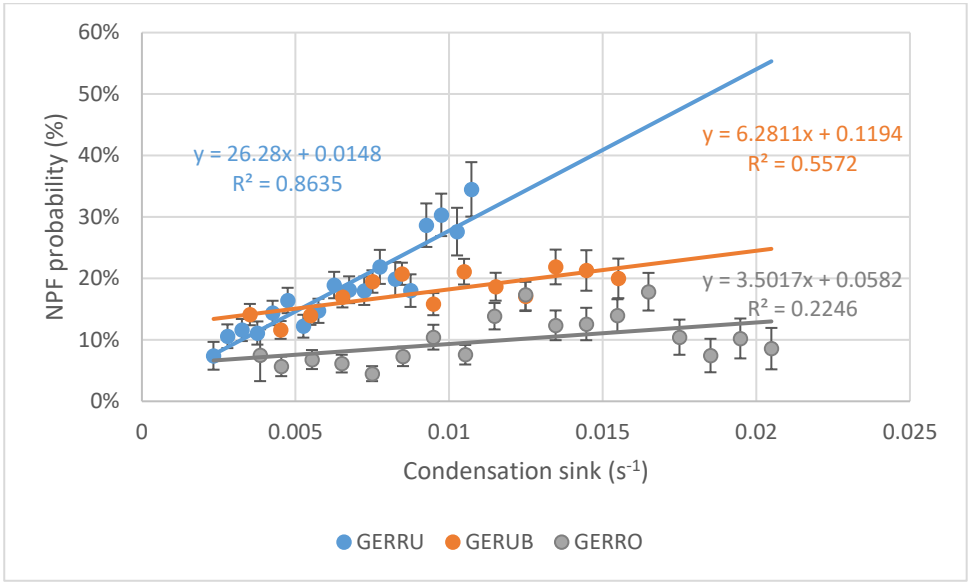

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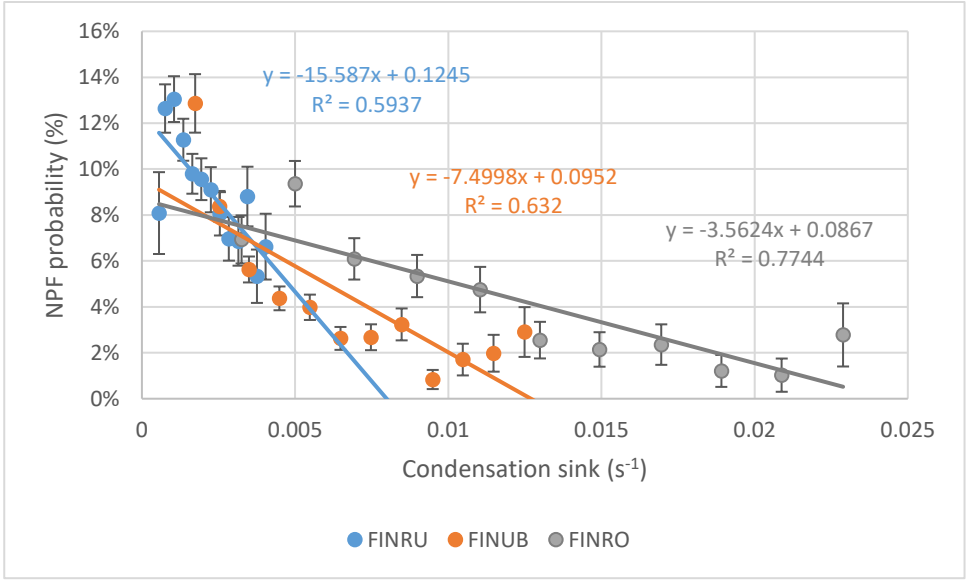

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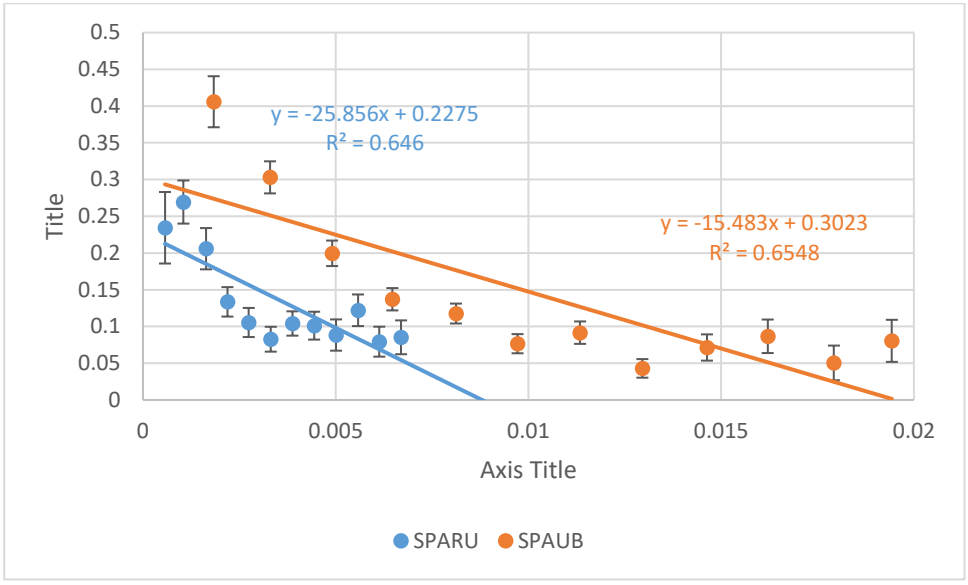

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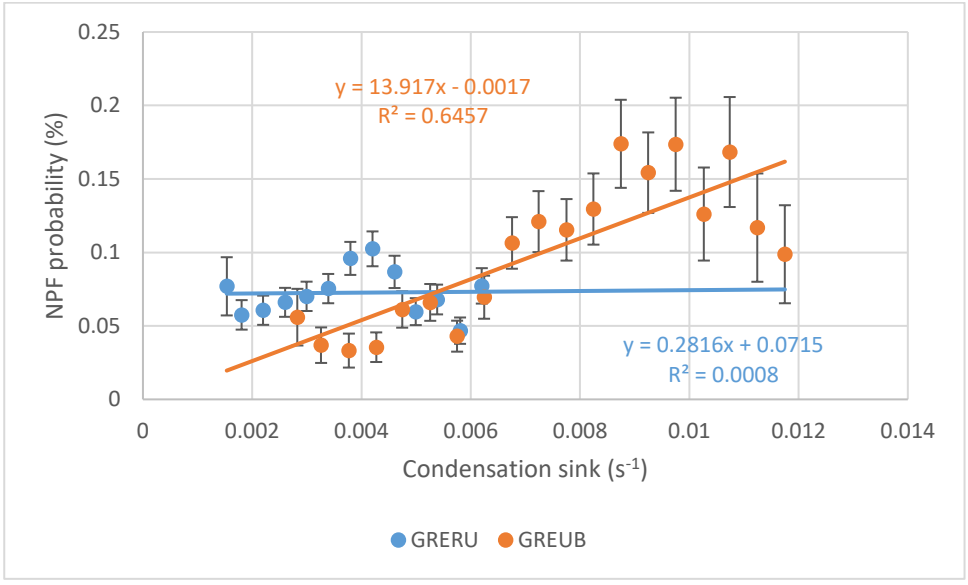

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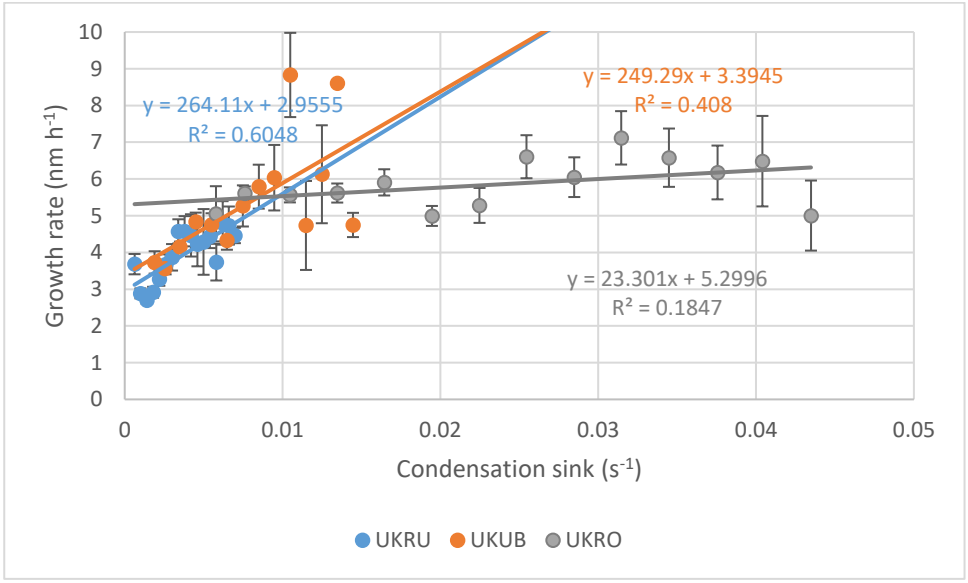
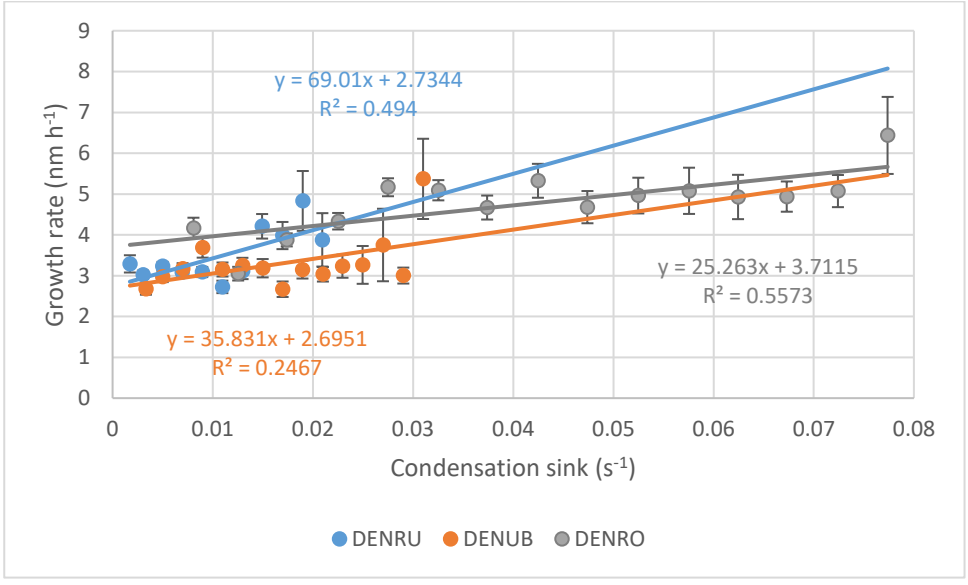
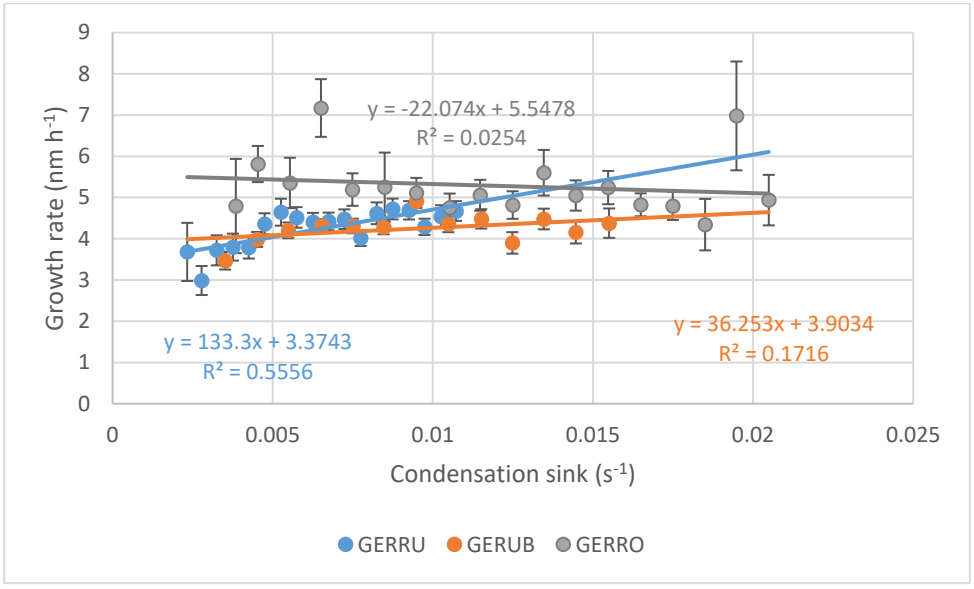

y = 264.11x + 2.9555
R² = 0.6048
y = 249.29x + 3.3945
R² = 0.408
y = 23.301x + 5.2996
R² = 0.1847
Growth rate (nm h-1)
Condensation sink (s-1)
UKRU
UKUB
UKRO


y = 69.01x + 2.7344
R² = 0.494
y = 25.263x + 3.7115
R² = 0.5573
y = 35.831x + 2.6951
R² = 0.2467
Growth rate (nm h-1)
Condensation sink (s-1)
DENRU
DENUB
DENRO



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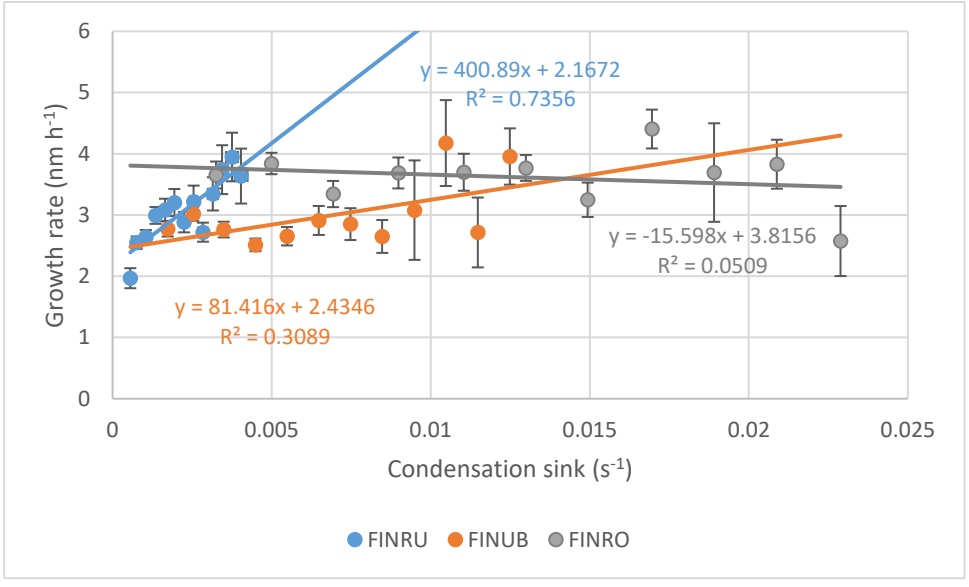

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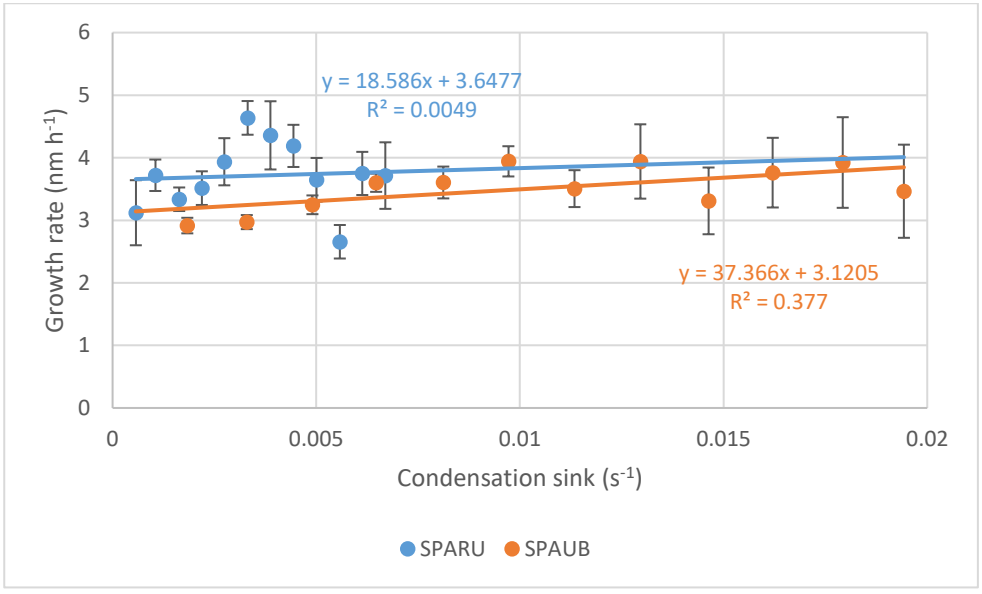

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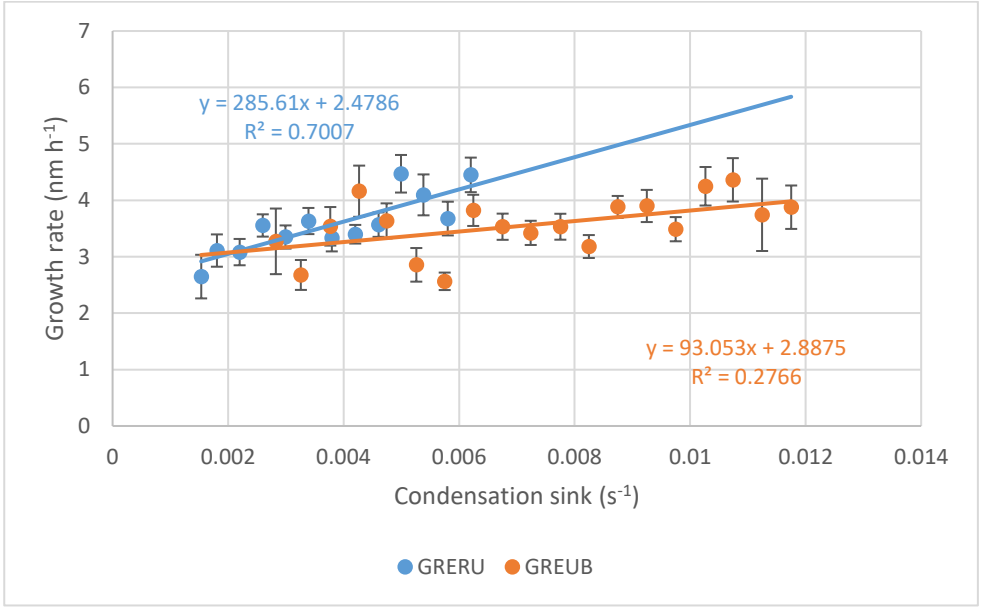

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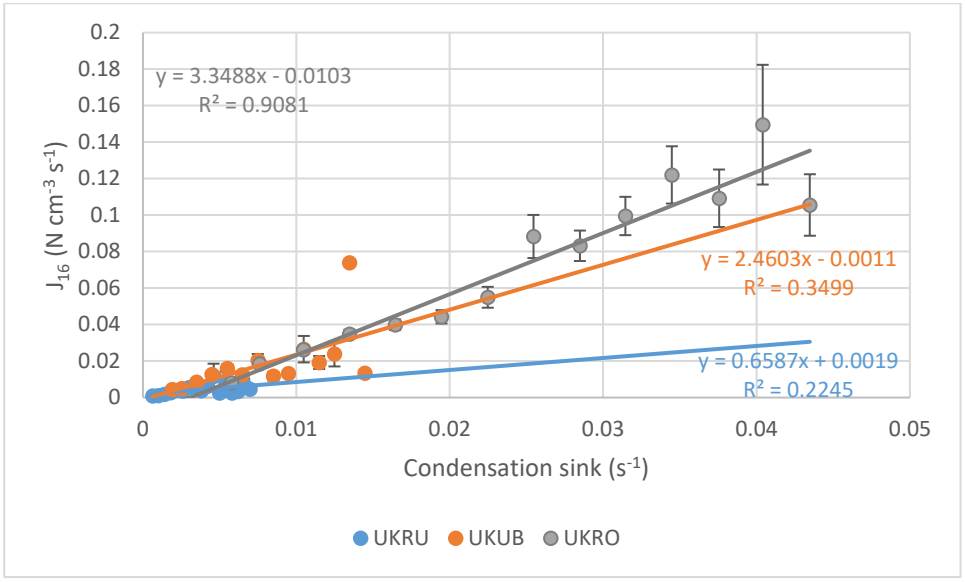

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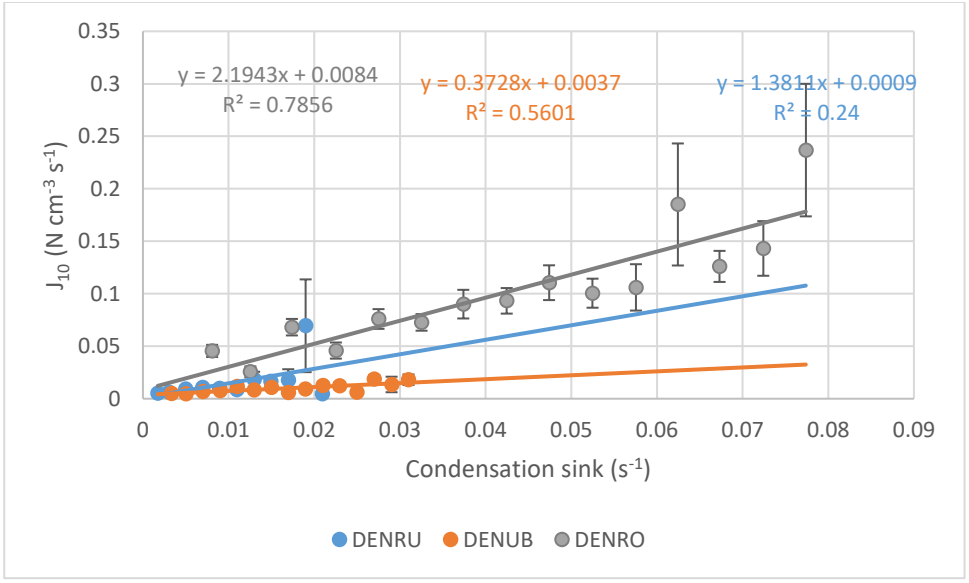

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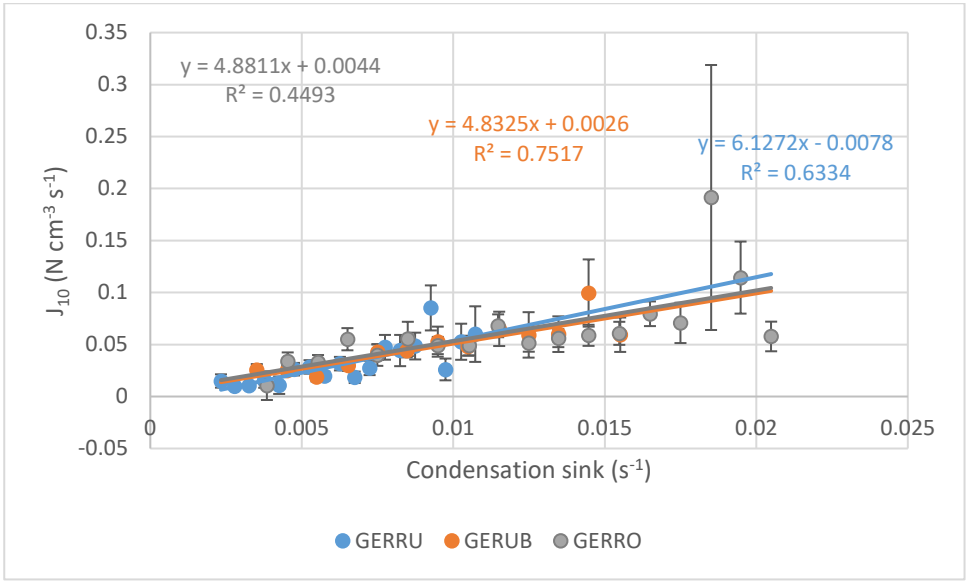

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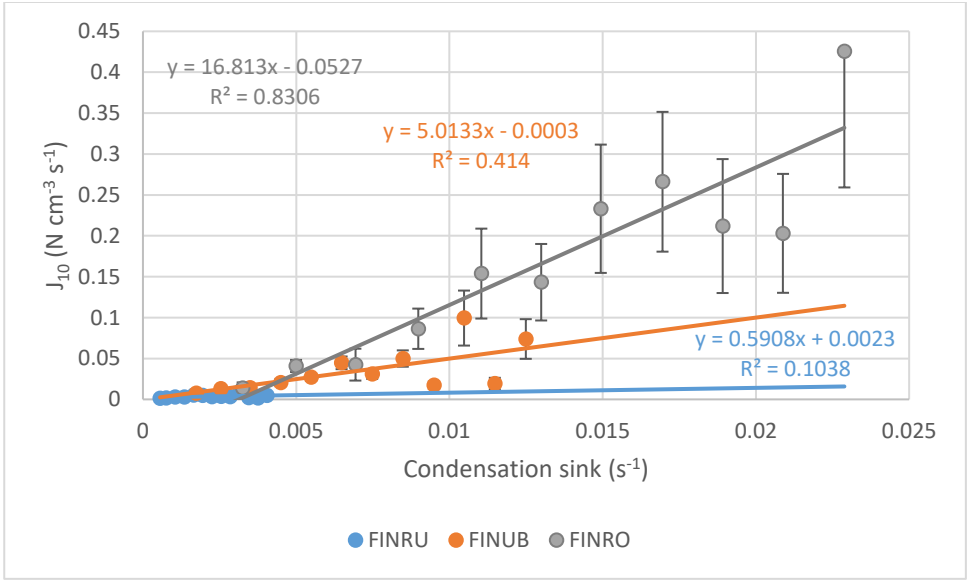

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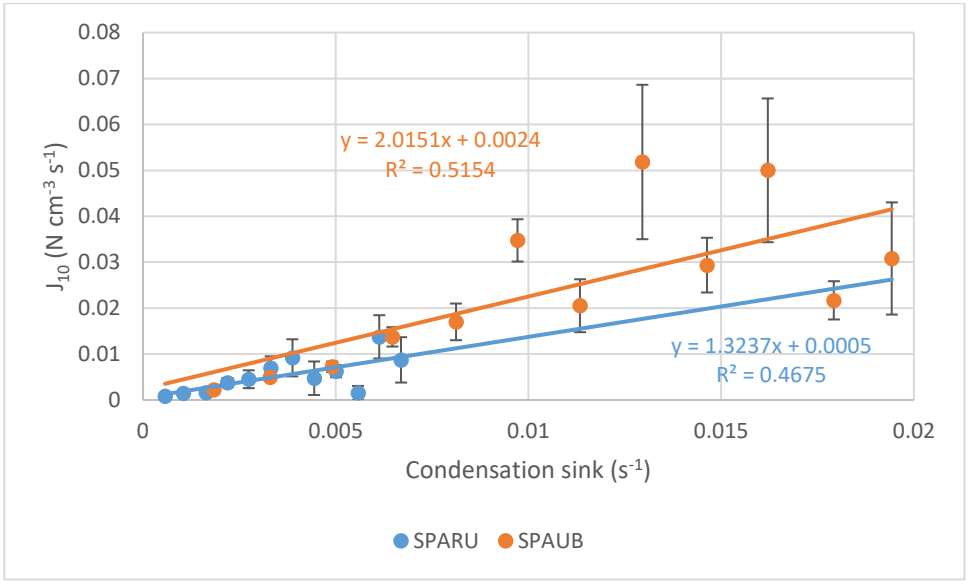

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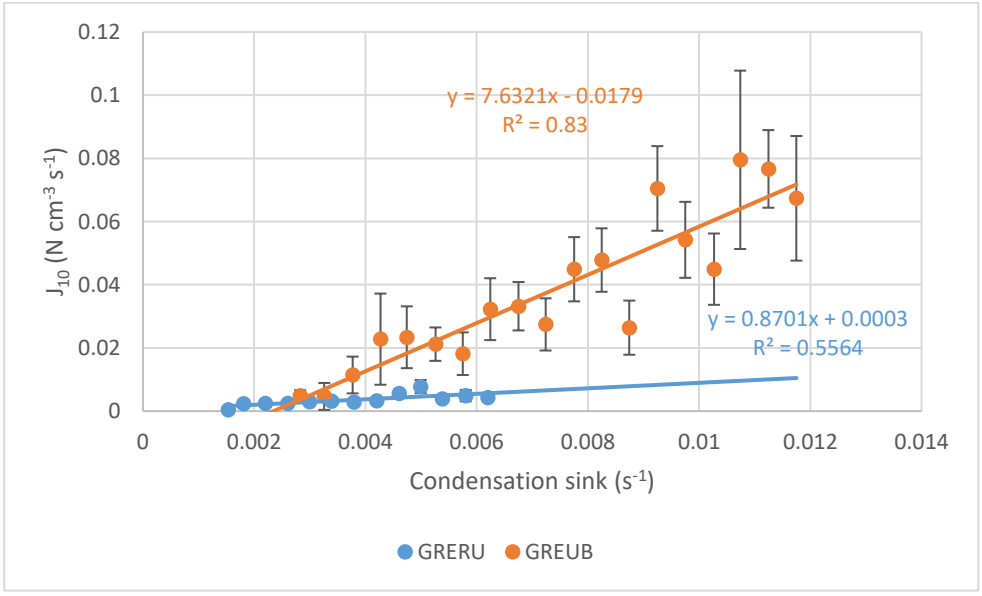

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Figure S2: Relation of average temperature and normalised slopes a_N^* for all but the Finnish sites.