

Figure S1: Testing the influence of data analysis software package and software user on SP2 results: BC mass size distribution in dependence of the mass equivalent diameter of the BC cores. The ambient air sample was measured using UMN's SP2. Data analysis, including evaluation of the SP2 calibration, was completely independently done by two persons from UMN and PSI, using their respective data analysis software packages. The difference below 70 nm is entirely due to the user defined choice of the lower cut in the data analysis.

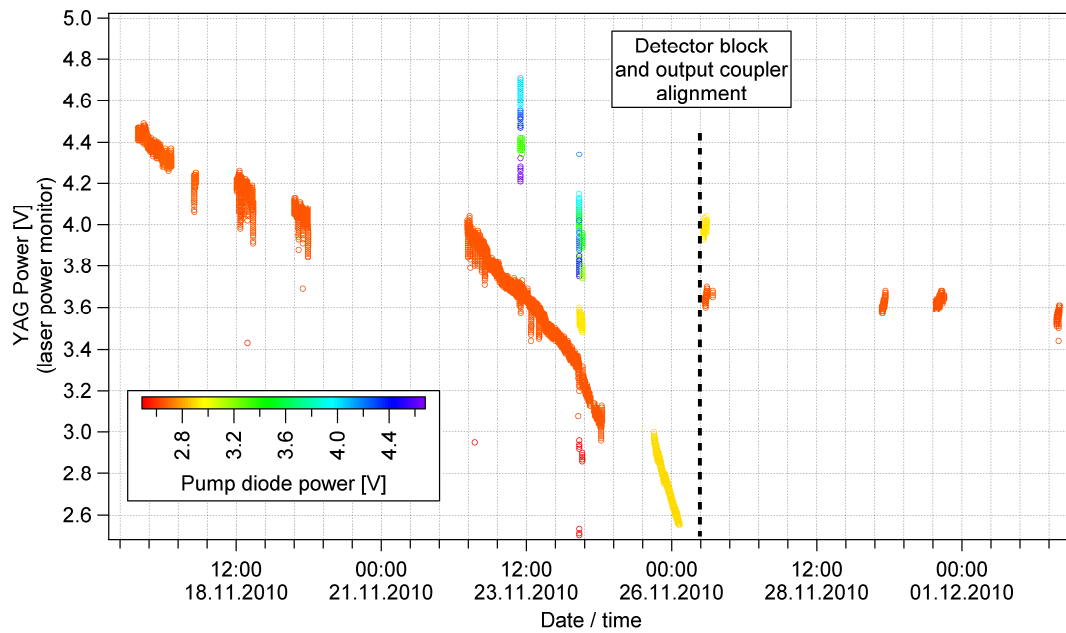


Figure S2: YAG power (laser power monitor) series for DLR's SP2. The laser power monitor readings are restricted to chamber temperatures between 33-34°C in order to filter fluctuations caused by the temperature dependence of the laser power monitor rather than true variations of the intra-cavity laser intensity. The colour scale indicates the power of the pump diode laser. Increased pump power results in increased laser power, except for the highest values (dark blue and purple), where saturation occurs. The orange data points indicate the standard operation condition of DLR's SP2. The laser power gradually decreased from the beginning of the campaign until 26 November 2010. A pump power increase applied on 25 November 2010 did not substantially increase the laser power. Consequently, the laser optics and detector block were realigned in the morning of 26 November, resulting in improved laser performance. This indicates that degrading laser performance was mostly caused by a drift of the laser optics rather than contamination of the high-reflectivity mirrors. After the realignment the laser performance remained essentially stable.