Like LCPs, IMFs emitted from the three sources also differ with respect to their energy spectra in the respective source rest frames. The energy spectra can be quantified in terms of inverse logarithmic slope parameters or effective source temperatures, T_s. The results of such evaluations for $^{136}Xe+^{209}Bi$ reactions at three bombarding energies are presented in Fig.4 for both, LCPs and lithium IMFs. Results for peripheral collisions are shown in the left panels and those for the central collisions in the right panels. As seen in this figure, the spectra associated with the IVS are significantly harder than those associated with evaporation from PLF and follow trends known from preequilibrium nucleon emission.

Together, the results on emission patterns imply the existence of two competing mechanisms for IMF emission - a statistical emission from accelerated PLFs and TLFs, on the one hand, and a nonstatistical emission from an effective IVS, on the other hand.

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6. Fragmentation of very neutron-rich projectiles around ^{132}Sn

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This experiment aims to isotopically identify and determine the production cross sections of residual nuclei in the fragmentation of very neutron-rich nuclei around ^{132}Sn produced in the fission of ^{238}U primary projectiles. These measurements will provide valuable information about a possible two-step reaction scheme (fission-fragmentation) to optimise the production of

extremely neutron-rich nuclei in future radiaoactive bema facilities (EURISOL,FAIR). At the same time, the interaction cross section, projectile proton- and neutron-pickup cross sections and proton removal cross sections of these medium mass neutron-rich isotopes will be measured. These observables will allow to investigate basic ground state properties of those extremely nuclei, like density distributions and/or binding energies.

The experiments are performed at the SIS synchrotron accelerator at GSI which delivers the ^{238}U beam with an energy of 1 A GeV. The beam impinge into a Pb target and the ^{132}Sn produced by fission is isotopically identify by using the first part of a magnetic spectrometer Fragment Separator (FRS)- see Fig.1. The ^{132}Sn produced impinges on a second reaction target of berylium for the identification of the fragments on the second part of the spectrometer.

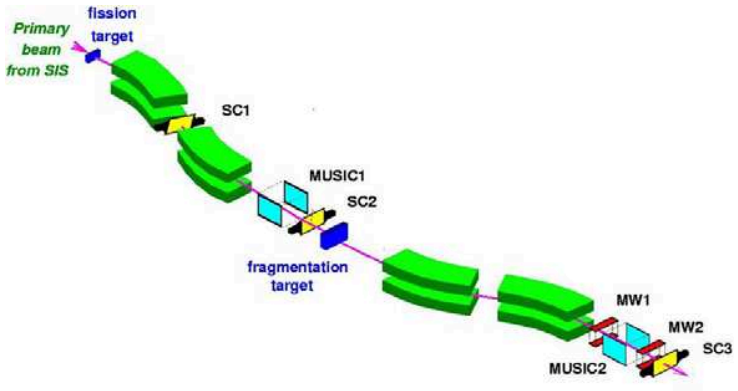

Fig.1 Experimental set-up including Fragment Separator (FRS) magnets

In order to optimize the production yield of fission residues and the isotopic separation, a compromise was found between the energy of the primary ^{238}U projectiles and the lead target thickness, corresponding to 950 A MeV and 1500 mg/cm^2. Having a primary beam current of 10^8s^{-1}, the rate of tin isotopes at the intermediate image plane of the FRS was varying between 10^3 and 10^4 s^{-1} along the isotopic chain between ^{124}Sn and ^{132}Sn.

In the present experiment, a fast scanning of proton- and neutron-pickup and proton-removal cross sections along long isotopic chains of fission residues was made. Five different magnetic settings of the FRS centered between ^{124}Sn and ^{132}Sn were used for that purpose.

For the correct assignment of the atomic and mass number of the produced residues a parasitic ^{136}Xe beam to calibrate the FRS was used just before the main beam time.

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