

# **Joint seminar of the NPI of the CAS**

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## **The Time of Flight channel and the new Dual Ion Microbeam facility as a tool for in-situ analysis at the Ruder Boskovic Institute**

Time of Flight elastic recoil detection analysis (ToF-ERDA) is a method for the mass separation and depth profiling of the light and medium elements. The main advantage of the ToF-ERDA system compared to Rutherford Backscattering (RBS) is the increased mass and depth resolution at the surface. Since 2008, ToF measurements have been carried out at the Ruder Boskovic Institute (RBI) in Zagreb, Croatia. Through modernization, the group at RBI has achieved the parameters of their homemade ToF system comparable, if not better, with the European leader – the University of Jyväskylä, Finland. In my presentation, I will describe the “homemade” ToF channel at RBI. I will compare our ToF system with the ToF system at RBI and the new ToF system installed in 2021 at the University of Tsukuba, Japan. I will also present the dual ion microbeam facility at RBI that was implemented this year. This new experimental setup is primarily designed to perform experiments in which one ion microbeam is used for irradiation and the other ion microbeam is used to analyse or "probe" changes in situ caused during target irradiation. Ion beams with MeV energy are provided by two tandem accelerators: a 1.0 MV Tandetron and a 6.0 MV EN tandem Van de Graaff. The light ion beam from the lower energy accelerator is focused by three magnetic quadrupole lenses and used for in-situ analysis, while heavy ion beam from Van de Graaff is focused by four electrostatic quadrupole lenses and used for irradiation. Simultaneous irradiation with two beams is also possible and may be of great interest due to the high ion flux of focused beams, which is typically  $10^3$ - $10^4$  times higher than that of an unfocused beam. Finally, I will describe my participation in the ToF experiment for external users, as well as my contribution to dual microbeam facilities.

The seminar will take place on Thursday, December 8, 2022 at 10:15 a.m. in the NPI meeting room (conference room).