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Development of Ion Beam Related Research Around 1.7 MV Pelletron in Jyväskylä During Five Years of Operation

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In late 2006 a fully functional 1.7 MV Pelletron tandem accelerator was donated to the University of Jyväskylä by the Technical Research Center of Finland. At that time the accelerator had only one RF ion source and one beamline for RBS. After an extensive development period over past five years, the facility now contains three ion sources and four beamlines.
The two biggest changes inside the accelerator tank during the past 5 years has been the change of corona discharge based potential division to resistor based and a new turbo pumped stripper installation. Resistor based charge division change increased the terminal voltage stability and enabled the use of lower beam energies down to 150 keV. In 2012 the original terminal stripper was changed to one which has turbo pump based gas circulation. This stripper change has improved beam transmission and together with injector modification increased the maximum obtainable beam energy above 20 MeV. However, for highest energies there still exists a clear contamination from multiple charge states after the analysis magnet, most likely due to charge exchange in the high-energy acceleration tube.
In the injector side a new injector magnet was installed and two new ion sources, sputtering and high brightness H−, have been commissioned. In the high energy area different beamlines for RBS, PIXE, TOF-ERDA and high energy ion beam lithography now exist.
In this talk, this development will be discussed as well as the experimental results on how an accelerator can survive from 100 litres of cooling water within the SF6 insulating gas.

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