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## **SHELS - Separator for Heavy Element Spectroscopy**

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Over the past 15 years, the electrostatic recoil separator VASSILISSA has been used for investigations of evaporation residues (ERs) produced in heavy-ion fusion reactions. In the course of the experimental work, a bulk of data on ERs formation cross sections was collected. In 2004–2010, the isotopes of Fm, Md, No, and Lr were studied using the GABRIELA (Gamma Alpha Beta Recoil Investigations with the ELeCtromagnetic Analyzer) detector system. These experiments showed that the efficiency of the existing set-up was not sufficient.

The goals of the modernization of the VASSILISSA electrostatic separator were to increase the transmission of asymmetric reactions, like  $^{22}\text{Ne} + ^{238}\text{U}$  or  $^{16}\text{O} + ^{244}\text{Pu}$  products, by the factor of 2–3 and to extend the region of reactions to be investigated up to symmetric combinations like  $^{136}\text{Xe} + ^{136}\text{Xe}$ . For this purpose, 3 electrostatic deflectors in the central part of the separator were replaced by a combination of two electrostatic and two magnetic deflectors. This modernization converted the energy selector VASSILISSA into the velocity filter SHELS. The new separator will be used together with the detector GABRIELA to carry out spectroscopic studies of heavy and superheavy isotopes. First tests of the set-up were performed with the beams of accelerated  $^{22}\text{Ne}$ ,  $^{40}\text{Ar}$ ,  $^{48}\text{Ca}$ , and  $^{50}\text{Ti}$  ions.

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