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DERICA project: Dubna Electron –Radioactive Ion Collider fAcility

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Development of radioactive ion beam (RIB) facilities is the highway of the low-energy nuclear physics development in the world the last 3 decades. RIB studies in Russian Federation at the moment are conducted only in one place –ACCULINNA/ACCULINNA-2 facility at Flerov Laboratory of Nuclear Reactions of the Joint Institute for Nuclear Research. However, scientific opportunities of these instruments are lower than those expected for the modern RIB center. It is proposed to develop powerful RIB facility DERICA (Dubna Electron –Radioactive Ion Collider fAcility) covering broad range of modern nuclear physics aspects (new isotope synthesis and production, its masses, lifetimes and decay modes, nuclear reactions and spectroscopy). The emphasis of the project is storage ring physics with ultimate aim of electron-RIB scattering studies in the collider experiments.

The DERICA concept combines in-flight production of RIBs by projectile fragmentation technique (primary beams up to uranium with energy ˜100 AMeV), stopping RIBs by gas catcher, reacceleration by LINAC-synchrotron combination, usage of reaccelerated RIBs for reaction studies and for storage ring experiments.

Status of DERICA project and the most recent information can be obtained at http://derica.jinr.ru. Letter-of-Intent for DERICA project is published in [1].

1. L.V. Grigorenko et al., Physics-Uspekhi 62 (2019) 675-690; http://derica.jinr.ru/pdf/publications/2019-Grigorenko-UFN_DERICA_en.pdf; http://derica.jinr.ru/pdf/publications/2019-Grigorenko-UFN_DERICA_rus.pdf.

Primary author: Prof. GRIGORENKO, Leonid (Flerov Laboratory of Nuclear Reactions, JINR)

Co-author: FOR DERICA COLLABORATION

Presenter: Prof. GRIGORENKO, Leonid (Flerov Laboratory of Nuclear Reactions, JINR)

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