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Development of an actinide target and laser ion-source test-bed at iThemba LABS, South Africa

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The main accelerator of iThemba Laboratory for Accelerator Based Sciences is a K = 200 Separated Sector Cyclotron (SSC). Use of the accelerator is shared by groups engaging in nuclear physics research, radiation therapy and radio-isotope production. The long term plan calls for the addition a high-intensity, K = 70 MeV proton accelerator to the laboratory, to both alleviate over-subscription of the SSC and to be used as a primary accelerator for radioactive beam production using the ISOL method. The proposed RIB facility would produce neutron rich species by fissioning uranium. As a first step in this programme, we present a proposal being developed at the laboratory to build a target and laser-ionization demonstrator at the laboratory, utilizing the present 66 MeV proton beam from the SSC. Neutron–rich isotopes produced in this way would be used for materials analysis and beta-decay studies.

Primary author: Dr BARK, Robert (iThemba LABS)

Co-author: Dr CONRADIE, Lowrie (iThemba LABS)

Presenter: Dr BARK, Robert (iThemba LABS)

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