APR05-2005-000354

Abstract for an Invited Paper
for the APR05 Meeting of
the American Physical Society

The Rare Isotope Accelerator: Driver Linac

RICHARD YORK, Michigan State University

The Rare Isotope Accelerator (RIA) is the highest priority for major new construction in the Nuclear Science Advisory Committee's Long Range Plan (April 2002). In addition, RIA is tied for third position among near term priorities in the Department of Energy's twenty-year facility plan (November 2003). RIA's high priority derives from its unique ability to help answer fundamental questions such as the origin of the heavier elements and to probe the fundamental laws of physics. RIA will produce rare isotopes at the very limits of stability that are not now available any place on earth. RIA begins with a high-power superconducting heavy-ion linac called the Driver Linac. The Driver Linac will accelerate any stable isotope from protons through uranium to energies of 400 MeV/u or more with a beam power of 100 kW to 400 kW. After acceleration of a stable isotope in the Driver Linac, the best known methods will be used to produce rare isotopes from the 100% duty factor beam. A general facility overview will be given, presenting key facility elements and isotope production mechanisms. Specific Driver Linac issues will be presented, including risk mitigation, failure mode analysis, as well as possible design solutions.