

The RILIS and LIST status and prospects

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The Resonance Ionization Laser Ion Source (RILIS) is the most frequently used ion source at ISOLDE because it offers unmatched selectivity and high reliability without compromising the yield of the isotope of interest. Additional benefits such as isomer selectivity, laser on/off based beam diagnostics and low emittance have proven essential for many experiments. To date, ionization schemes for 31 elements have been developed for the ISOLDE RILIS and 27 of these have been used for on-line radioactive ion beam production. The RILIS operating time in 2012 exceeded 3000 h and ion beams of 13 elements were provided for 24 different experiments. This included the first on-line physics experiment to use the newly established Laser Ion Source Trap (LIST) for active suppression of surface ionized isobars.

In addition to routine maintenance and minor improvements to the RILIS installation, during the CERN long shutdown (LS1) period, a many-sided approach to improving the RILIS performance, reliability and operating conditions has been initiated. This includes the RILIS cabin extension; a machine protection and automation system to enable on-call operation; off-line ionization scheme development; high resistance cavity tests for improved selectivity by beam micro-gating; new laser beam launch system and reference area. Further optimization and characterization of the LIST has been performed at Mainz University and a new LIST design is being tested. A status report of these developments and an outlook towards the planned 2014 RILIS system will be presented.

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