

Recent results with the radioactive ion beam facility in Brazil (RIBRAS)

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The RIBRAS facility consists of two superconducting solenoids of maximum magnetic field $B=6.5$ T, coupled to the 8UD-Pelletron tandem Accelerator installed at the University of São Paulo Physics Institute [1, 2]. It is the first radioactive beam facility of the Southern Hemisphere. Light radioactive ion beams are produced through transfer reactions, using solid or gaseous production targets of ${}^9\text{Be}$, LiF , ${}^3\text{He}$ etc. The solenoids make a magnetic rigidity selection and the use of the two solenoids with a degrader between them allows the production of quite pure secondary beams. Low energy (3-5 MeV/u) radioactive beams of ${}^6\text{He}$ (halo nucleus), ${}^8\text{Li}$, ${}^7\text{Be}$ and ${}^8\text{B}$ are produced with quite competitive intensities of 10^4 to 10^6 pps and used to study elastic, inelastic, and transfer reactions on a variety of light, medium mass and heavy secondary targets.

The scientific program is concentrated mainly on elastic scattering studies on light (p , ${}^9\text{Be}$, ${}^{12}\text{C}$, ${}^{27}\text{Al}$) [3–6] medium mass (${}^{51}\text{V}$, ${}^{58}\text{Ni}$) and heavy targets (${}^{120}\text{Sn}$) [7]. In the case of ${}^6\text{He}$ beam, the production of ${}^4\text{He}$ through break-up into ${}^4\text{He}+2n$, or through 1 and 2 neutron transfer reactions is also measured [8]. These results allow shedding light on the interaction potential and on the reaction mechanism. The data will be presented as well as results of theoretical calculations including the continuum.

Resonance elastic scattering of radioactive beams (${}^6\text{He}$ and ${}^8\text{Li}$) on proton targets, and transfer reactions of astrophysical interest will also be presented. One example is the ${}^8\text{Li}(p,\alpha){}^5\text{He}$ reaction [9], realized in inverse kinematics and using the thick target method, where the excitation function could be measured at low energies.

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