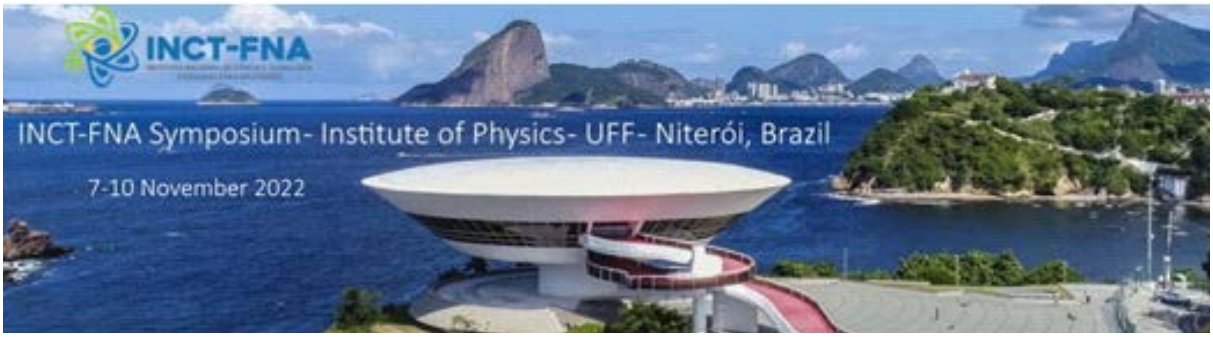

RIBRAS Facility: an overview, recent results and future plans.

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The “Radioactive Ion Beams in Brasil” (RIBRAS) system is in operation since 2004 at the “Open Laboratory for Nuclear Physics” (LAFN), that is the only laboratory in Brazil with research in basic and applied nuclear physics. The RIBRAS system consists of two super-conducting solenoids of maximum magnetic field B=6.5 T, coupled to the 8UD-Pelletron tandem Accelerator of Instituto de Fisica of the Universidade de São Paulo (IFUSP), Brazil [1–3]. It is the first RIB facility in the southern hemisphere and is presently the only experimental equipment in South America capable of producing secondary beams of rare isotopes. It delivers light radioactive ion beams, such as ^{6}He, ^{8}Li, ^{7}Be, ^{10}Be, ^{12}B, and ^{8}B, produced by transfer reactions, in the collision between the primary beam of the Pelletron Accelerator and the primary target. The radioactive secondary beams are separated, focused, and purified by the solenoids. The currently produced RIBs have intensities between 10^{3}-10^{6} pps, and energies up to 3-5 MeV/n. The study of nuclei out of the line of stability is one of the most active fields in low energy nuclear physics nowadays. Over the last 10 years we have developed an extensive research program, involving mostly low energy elastic scattering measurements of exotic beams on light, medium and heavy mass targets, at energies around the Coulomb barrier. Besides that, some breakup and neutron transfer reactions were observed in collisions between radioactive nuclei

on targets of different masses, from light to heavy ones. In all cases, the cross sections were compared to sophisticated theoretical calculations showing good agreement. Also, a large production of alpha particles has been identified in collisions between the neutron rich ^{6}He and proton rich ^{7}Be on light targets, even at low energies. These particles can come from the breakup of, e.g., the ^{6}He nucleus in the presence of the target nucleus or from transfer reactions. It is of interest to understand these different mechanisms. An overview, recent results of this research and future perspectives will be presented.

References

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