

An Update on the recent developments of RIBRAS

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With the advent of new radioactive ion beam facilities, It is possible to investigate the nuclear reaction studies with unstable projectiles. Reactions induced by radio active ion beams is one of the current interesting topics in nuclear physics, due to the observation of cluster structure and the weak breakup energies, when compared to the stable nuclei . RIBRAS (Radioactive Ion Beams in Brasil) is a twin solenoid radioactive ion beam facility at the University of Sao Paulo, which delivers secondary beams such as ${}^6\text{He}$, ${}^8\text{Li}$, ${}^8\text{B}$, ${}^7\text{Be}$ with good intensities to perform nuclear physics experiments [1, 2]. In the past, several experiments on elastic scattering, alpha particle production, total reaction cross sections were studied on various targets of different masses [2]. A large production of alpha particles has also been observed in the reactions with ${}^6\text{He}$ on several targets [3]. Recently, experiments were performed to study the resonant elastic scattering and resonant transfer reactions, using inverse kinematics and thick targets. We plan to install a small chamber at the end of the RIBRAS beam line, in order to detect the gamma rays in coincidence with the charged particles to study break up reaction dynamics. We will be presenting the recent experimental results on elastic scattering, alpha-particle production and total reaction cross sections, as well as the resonant elastic and transfer reactions. We also intend to discuss the recent developments on the design of a new chamber to detect the gamma rays in coincidence with the charged particles, along with the monte carlo simulations of the trajectories and the size of the beam spot in the newly planned chamber.

References:

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- 3) P. N. De Faria et al., Phys. Rev. C 82, 034602 (2010).

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