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Multi-nucleon transfers using two-neutron halo 6He on 12C at 30 MeV using the SHARC and TIGRESS arrays at TRIUMF ISAC-II

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The 12C(6He,4He)14C and 12C(6He,8Be)10Be multi-nucleon transfer reactions are studied at the TRIUMF ISAC-II facility using SHARC (Silicon Highly-segmented Array for Reactions and Coulex), a compact charged particle silicon detector array, together with TIGRESS (TRIUMF-ISAC Gamma-Ray Escape Suppressed Spectrometer), a high-efficiency germanium γ-ray detector array.
The (6He,4He) transfer reaction is studied to investigate its possible advantages over (t,p) as a surrogate reaction for two-neutron transfer in a well-known (t,p) case [1]. Due to the close proximity of the 14C excited states, charged particle –gamma coincidences are necessary and obtained through the powerful combination of SHARC and TIGRESS. The (6He,8Be) transfer reaction on 12C is suggested to be a two-proton transfer [2], yet another possibility is that it actually is an alpha transfer from 12C on 6He. Such a mechanism could provide additional insights on the 3α structure of 12C with possible nuclear astrophysics implications.
This presentation will discuss the preliminary results obtained in both cases, as well as elastic and inelastic scattering data.

[1] F.Ajzenberg-Selove et al., Phys.Rev.C17, 1283 (1978); [2] M.Milin et al., Phys.Rev.C70, 044603 (2004)

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