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Investigating the nature of excited 0^+ states populated via the ^{162}Er(p,t) reaction

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Many approaches have been implemented in nuclear structure physics to interpret the nature of excited states in well-deformed nuclei, such as vibrational excitations in β phonons and γ phonons, as well as pairing excitations. However, due to a paucity of data about excited states in rare earth nuclei, in many cases even the first excited state, 0_2^+, is not known.

Direct two-neutron transfer reactions are a valuable tool for probing $0^+ \rightarrow 0^+$ transitions in well-deformed nuclei. Excited 0^+ states in the $N = 92$ nucleus ^{160}Er have been studied via the (p, t) reaction with a highly-enriched ^{162}Er target at the Maier-Leibnitz Laboratory in Garching, Germany, using a proton beam energy of 22 MeV and 24 MeV supplied by a Tandem Van de Graaff. Reaction products were momentum-analyzed with a Quadrupole-3-Dipole magnetic spectrograph. Strong population of the 0_2^+ state was observed with a large cross section greater than any other excited 0^+ state. Preliminary results of the relative population of excited 0^+ states in ^{160}Er and a possible intepretation will be presented.

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