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Investigating the candidate 5-alpha cluster state in ^{20}Ne at $E_x = 22.5$ MeV with the $^{22}\text{Ne}(p,t)^{20}\text{Ne}$ reaction

The study of alpha-cluster in light nuclei have been well documented with experimental evidence. In the recent experiment performed at iThemba LABS using (p,t) reaction on ^{22}Ne with the K600 magnetic spectrometer, a tentative candidate for 5-alpha cluster state at 22.5 MeV, which is situated at 3.3 MeV above the 5-alpha break-up threshold was found. However, this state could not be accounted for by theoretical shell-model calculations and angular distribution data taken at forward angles including zero degrees. In the present project, (p,t) reaction on ^{22}Ne has been carried out at zero degrees using the K600 magnetic spectrometer at iThemba LABS in order to confirm the existence of this state. A proton beam with an energy of 80 MeV from the Separated Sector Cyclotron (SSC) facility impinged on a ^{22}Ne gas target at lab angles of zero-degree was considered. Preliminary results of these experiments will be discussed.

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