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Investigating the candidate 5-alpha cluster state in 20Ne at Ex = 22.5 MeV with the 22Ne(p,t)20Ne 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 22Ne 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 22Ne 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 22Ne gas target at lab angles of zero-dergee was considered. Preliminary results of these experiments will be discussed.

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