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Investigating the candidate 5-alpha cluster state at 22.5 MeV with the (p,t) and (p,3He)

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The study of alpha-cluster (two proton two neutron) in light nuclei have been well documented with experimental evidences. Meanwhile, in the recent experiments performed at iThemba LABS using (p,t) reaction on 22Ne with the K600 magnetic spectrometer, a 22.5 MeV state was found, which accounts for 5-alpha cluster situated at 3.3 MeV above the 5-alpha break-up threshold. 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,3He) reaction on 22Ne will be carried out at multiple angles, to investigate this state in order to ascertain its spin, parity and isospin. In this case, a proton beam with an energy of Elab= 80 MeV from the Separated Sector Cyclotron (SSC) facility impinged on a 22Ne gas target at lab angles of Θlab= (00, 70, 170, 270) will be considered. Preliminary results of these experiments will be discussed.

Apply to be
 considered for a student
   award (Yes / No)?

Yes

Level for award
 (Hons, MSc,
   PhD, N/A)?

MSc

Main supervisor (name and email)
and his / her institution

Dr. Iyabo Usman
iyabo.usman@wits.ac.za
University of the Witwatersrand

Would you like to
 submit a short paper
 for the Conference
 Proceedings (Yes / No)?

No

Primary author: Ms BALOYI, Lerato (University of the Witwatersrand)

Co-authors: Dr USMAN, Iyabo (University of the Witwatersrand); Dr SWARTZ, Jacobus (Department of Physics and Astronomy, Aarhus University, DK-8000 Aarhus C, Denmark); Prof. CARTER, Jonn (University of the Witwatersrand); Dr NEVELING, Retief (Department of Nuclear Physics, iThemba LABS, Somerset West 7129)

Presenter: Ms BALOYI, Lerato (University of the Witwatersrand)

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