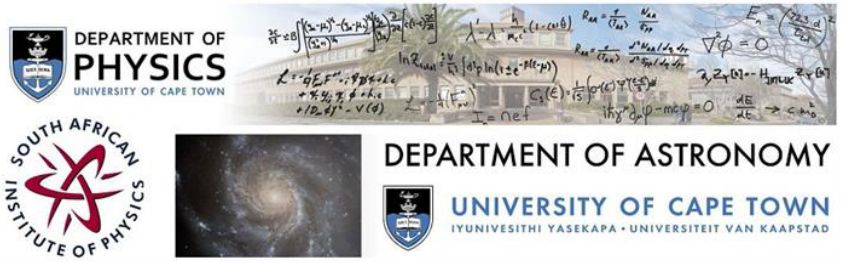

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Searching for the low-energy enhancement in ⁹¹Zr

Tuesday, 5 July 2016 14:20 (20 minutes)

Abstract content
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The gamma;-ray strength function (gamma; SF) is defined as a measure of the average reduced decay probability of a nucleus. This concept is useful at high excitation energies where the spacing between the levels is small and gives information on degrees of freedom and underlying nuclear dynamics. Evidence of the low-energy enhancement in the
gamma; SF for energies less than 4 MeV has been discovered in several fp-shell nuclei, e.g. see Ref.[1].
Recently, a strong enhancement of M1 transitions in ⁹⁰Zr has been predicted for gamma;-ray energies below 2 MeV in shell model calculations [2]. In this work we explore the existence of the low-energy enhancement in neighboring ⁹¹Zr. The experiment ⁹⁰Zr(d,p)⁹¹Zr was conducted at the Oslo Cyclotron Laboratory (OCL). The SiRi (silicon telescope) array was used to detect charged ejectiles from the reaction. The CACTUS NaI(Tl) array was utilized to detect rays that were in coincidence with charged particles. The nuclear level density and gamma; SF were extracted with the Oslo method [3]. These quantities were used to calculate (n, gamma;) cross sections with the Talys reaction codes. In this presentation the results will be discussed.

[1] M. Guttormsen, et al., Phys. Rev. C 71, 044307 (2005).
[2] R. Schwengner, et al., Phys. Rev. Lett.111, 232504 (2013).
[3] A. Schiller, et al., Nucl. Instrum. Meth. Phys. Res. A 447, 498 (2000).

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Mathis Wiedeking
wiedeking@tlabs.ac.za

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Primary author: Mr ZIKHALI, Bonginkosi Richard (University of Zululand)

Co-authors: GARROTE, F.L. Bello (University of Oslo, Oslo, Norway); GUTTORMSEN, Magne (University of Oslo, Oslo, Norway); Dr WIEDEKING, Mathis (iThemba Labs); Dr NTSHANGASE, Sifiso (University of Zululand); Dr KHESWA, Vincent (University of Oslo)

Presenter: Mr ZIKHALI, Bonginkosi Richard (University of Zululand)

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