



Contribution ID: 92

Type: Oral Presentation

Searching for the low-energy enhancement in ^{91}Zr

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

Abstract content (Max 300 words) Formatting & Special chars

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 ^{90}Zr 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 ^{91}Zr . The experiment $^{90}\text{Zr}(d,p)^{91}\text{Zr}$ 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).

This work is based on the research supported in part by the National Research Foundation of South Africa.

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

Mathis Wiedeking
wiedeking@tlabs.ac.za

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

no

**Please indicate whether
this abstract may be
published online
(Yes / No)**

yes

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)

Session Classification: Nuclear, Particle and Radiation Physics (1)

Track Classification: Track B - Nuclear, Particle and Radiation Physics