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Search for collective structures in ^{186}Os

Various interpretations of the $K = 2^+$ structures in the Os nuclei have been a subject of great interest in the nuclear physics community [1-3]. The nature of these structures is not fully understood. These structures could be interpreted as time-dependent gamma-vibration of a nuclear shape or as due to axial asymmetry of the nuclear shape. The current work seeks to give more insight on the microscopic nature of the $K = 2^+$ bands by studying the excited states in ^{186}Os , using the $^{186}\text{W} (^4\text{He}, 4n) ^{186}\text{Os}$ reaction. The excited states in this nucleus were populated by bombarding a ^{150}Sm target with a 47 MeV beam of ^4He ions. The iThemba LABS AFRODITE gamma-ray spectrometer was used to detect the gamma-rays that were emitted from the reaction products. Angular correlation and linear polarization measurements are performed to accurately assign spins and parities to the levels of the known and new structures in ^{186}Os .

[1] J. M Allmond et al., Phys. Rev. C78, 014302 (2008).

[2] C. Y. Wu et al., Nucl. Phys. A607, 178 (1996).

[3] D. G. Burke, Phys. Lett. B406, 200 (1997).

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

Yes

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

PhD

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