

Abstract Submitted
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Direct Observation of a New $J^\pi = 2^+$ State in ^{12}C through the $^{12}\text{C} + \gamma \rightarrow 3\alpha$ Reaction¹ W.R. ZIMMERMAN, M.W. AHMED, S.S. HENSHAW, I. MAZUMDAR, J.M. MUELLER, L.S. MYERS, M.H. SIKORA, S. STAVE, H.R. WELLER, Triangle Universities Nuclear Laboratory, M. GAI, Laboratory for Nuclear Science at Avery Point — The second $J^\pi = 2^+$ state in ^{12}C , predicted over fifty years ago to exist as an excitation of the Hoyle state, has been unambiguously identified in the $^{12}\text{C}(\gamma, \alpha)^8\text{Be}$ reaction. The α particles produced by the photodisintegration of ^{12}C were detected using an optical time projection chamber. Initial data were collected at beam energies between 9.1 and 10.7 MeV using intense, nearly monoenergetic γ -ray beams available at the HI γ S facility. The measured cross sections and angular distributions unambiguously establish the existence of a broad 2^+ state near 10 MeV in ^{12}C . Additional data were recently taken at beam energies of up to 11.2 MeV and show no evidence for an additional 2^+ state previously reported to exist near 11 MeV [1].

[1] F. Ajzenberg-Selove, Nucl. Phys. **A506**, 1 (1990).

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