

Abstract Submitted
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Study of Carbon 16 Within the Three-Body Model¹ H.J. BROWN, Florida State University, F.M. NUNES, Michigan State University — In this study the Carbon 16 nucleus has been examined within a three-body model Carbon 14 + n + n. The valence neutrons interact with a realistic n-n force while the Carbon 14 - neutron interaction was fitted to reproduce the low-lying single particle spectrum of Carbon 15. Two shell model pictures of Carbon 15 were considered, each differing in the treatment of the p-wave orbitals. The main results presented assume the Carbon 14 core is inert but we also will mention preliminary results including core deformation and excitation. Our findings indicate that in order to build a more realistic Carbon 16, one must account for the inversion of the p-wave resonances in Carbon 15. Our model is in fair agreement with experimental values for the Carbon 16 ground state three-body binding energy and RMS radius. This calculation predicts the lowest 0.0+ and 2.0+ states in Carbon 16 with the proper ordering but excitation energies are a bit smaller than experiment.

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Holly Brown
Florida State University

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