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**Vibrational to Rotational Structure Evolution in Medium Mass Nuclei** MIRELA S. FETEA<sup>1</sup>, JOE HANLEY<sup>2</sup>, PHILIP PENDLETON<sup>3</sup>, U. of Richmond, WRIGHT NUCLEAR STRUCTURE LABORATORY AT YALE UNIVERSITY COLLABORATION<sup>4</sup>, UNIVERSITY OF SURREY, GUILDFORD, ENGLAND COLLABORATION<sup>5</sup> — A recently introduced empirical method is used to follow the evolution from vibrational to rotational structure in nuclei as a function of spin. EGOS (E-Gamma Over Spin) plots connect the relation between the gamma-ray energy and spin with the shape of the nucleus. In the E-GOS plots the trajectory for a vibrator decreases hyperbolically, while the trajectory for a rotor slightly increases to become almost flat for any higher spin. Results of the EGOS analysis for the medium mass transitional nuclei will be presented. The work was completed in collaboration with groups from the Wright Nuclear Structure Laboratory at Yale University, and from the University of Surrey, Guildford, England and was supported by the NSF Grant No. PHY 0204811 and Research Corporation Grant No. CC5494

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