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Strongly Coupled Rotational Band in ^{33}Mg

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The “Island of Inversion,” centered on ^{32}Mg , is a region where a narrowed $N=20$ shell gap and collective np - nh excitations result in nuclei that exhibit deformation in their ground states. Despite years of theoretical and experimental efforts, a complete picture of the deformation in this region has not been achieved and the level schemes remain largely incomplete for many of these nuclei. Furthermore, the presence of rotational band structures, which are key signatures of deformation, have only recently been observed in this region. Results from a measurement of the low-lying level structure in ^{33}Mg , populated in a two-stage projectile fragmentation reaction and studied with GRETINA, will be presented. The experimental level energies, ground state magnetic moment, intrinsic quadrupole moment, and γ -ray intensities compared to a leading order rotational model in the strong-coupling limit will also be shown. Complementary β -decay data for ^{33}Mg will also be presented along with implications for the observed structure.

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