

Abstract Submitted
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Rotational Band Structure in ^{32}Mg ¹ HEATHER CRAWFORD,
Lawrence Berkeley Natl Lab, NSCL E11029 COLLABORATION TEAM — There
is significant evidence supporting the existence of deformed ground states within the
neutron-rich $N = 20$ neon, sodium, and magnesium isotopes that make up what is
commonly called the "Island of Inversion". However, rotational band structures, a
characteristic fingerprint of a rigid non-spherical shape, have yet to be observed. We
report on a measurement and analysis of the yrast (lowest lying) rotational band in
 ^{32}Mg up to spin $I = 6+$, produced in a two-step projectile fragmentation reaction
and observed using the state-of-the-art γ -ray tracking detector array, GRETINA.
Large-scale shell model calculations using the SDPF-U-MIX effective interaction
show excellent agreement with the new data. Moreover, a theoretical analysis of the
spectrum of rotational states as a function of the pairing gap, together with cranked
shell model calculations, provides intriguing evidence for a reduction in pairing cor-
relations with increased angular momentum, also in line with the shell-model results.

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Heather Crawford
Lawrence Berkeley Natl Lab

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