Abstract Submitted
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Differential spectroscopy using knockout reactions: the case of ^{33}Mg DANIEL BAZIN, Michigan State University — The structure of ^{33}Mg has been investigated using proton and neutron knockout reactions from radioactive beams of ^{34}Al and ^{34}Mg, respectively. The experiment was conducted at the Radioactive Isotope Beam Factory, where the 240 MeV/u radioactive beams where produced in the BigRIPS fragment separator[1] from the fragmentation of a 350 MeV/u ^{48}Ca primary beam. γ-rays emitted during the reactions were recorded in the DALI2 array[2], while knockout residues were collected and analyzed by the Zero Degree Spectrometer operated in dispersive mode. The analysis of the momentum distributions recorded in coincidence with the γ-rays, as well as the comparison between the two reactions, yield unambiguous result on the parity assignments of the ^{33}Mg ground and excited states. In particular, the negative parity of the ground state is firmly established from this data. In addition, absolute partial cross sections are deduced and used with an eikonal reaction model to extract spectroscopic factors.

[1]T. Kubo *et al.*, Prog. Theor. Exp. Phys. **2012**, 03C003
[2]S. Takeuchi *et al.*, arXiv:1403.5349v2 (2014)

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