

Tripathi *et al.* Reply: Yordanov *et al.* [1] reported a measurement of the spin and magnetic moment of the ground state of ^{33}Mg and inferred a negative parity based on a proposed ground-state configuration whose magnetic moment agrees with the measured value. We measured [2] the β decay of ^{33}Mg to the ground state and excited states of ^{33}Al . The large measured ground state to ground-state branch [37(8)%] is consistent only with positive parity for the ground state of ^{33}Mg as the ground state of ^{33}Al is $5/2^+$. This conclusion does not rely on any nuclear structure model. A possible ground-state wave function was proposed by us which is consistent with the experimental results of both papers. This is only a proposal, and it is quite possible that the true wave function is more complex than those proposed in either paper.

The authors of the preceding Comment [3] on our Letter dispute the positive parity assignment to the ground state of ^{33}Mg . The main thrust of the Comment is to question the validity of the β decay experiment. We would like to emphasize that the β decay measurement was performed at the National Superconducting Cyclotron Laboratory using the dedicated Beta Counting Station (BCS) [4] along with the Segmented Gamma Array (SeGA) [5]. All necessary precautions were taken to obtain accurate β -decay strengths. The authors are well aware of the “pandemonium” effect and carefully considered its possible impact. The rather low neutron separation energy of 5.5 MeV in the daughter ^{33}Al leaves a narrow window of less than 1 MeV between the highest state observed to be populated in the β decay and the neutron separation energy in ^{33}Al . It is highly unlikely that the possible unobserved β -decay

branches to states in this narrow window could account for 37% of the total β -decay strength, especially when the β decay to the next 8 MeV of excitation accounts for only 14% of the total strength which goes to neutron unbound states.

We agree with the conclusion of the Comment that only further careful experiments can shed more light on the question of the parity of the ^{33}Mg ground state and the ground-state configuration of this exotic nuclei inside the island of inversion.

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