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Report on $^{238}\text{U}(^{22}\text{Ne}, x)$ and $^{238}\text{U}(^{26}\text{Mg}, x)$ to approach the Island of Inversion at $N=20$

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In this presentation, we report on our current status of the analysis and preliminary results of two AGATA-PRISMA experiments performed at Laboratori Nazionali di Legnaro, consisting of a ^{22}Ne and ^{26}Mg beam emitted upon an ^{238}U target. AGATA is coupled with mass spectrometer PRISMA for ion identification and γ -ray coincidence. In both experiments, the ^{238}U target is backed with a ^{93}Nb degrader for lifetime measurements using the Doppler-Shifted Attenuation Method. The goal is to invoke multi-nucleon transfer reactions in order to produce neutron-rich Ne, F & Mg nuclei. This will allow us to map the transition into the Island of Inversion at $N=20$ and map out the boundaries of the island. Of particular interest are negative parity states, arising from particle-hole excitations to the fp-shell. Such intruder states are energetically favored in the Island of Inversion. Decay branching ratios and lifetimes of negative parity states will help to refine the theoretical description of the onset of deformation and shape coexistence.

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