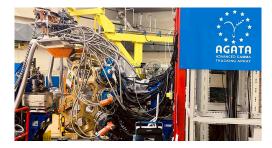
## The 24th AGATA Week - ACC Meeting



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## Report on AGATA experiment 001 phase 2 (LNL PAC: 22.07)

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The disappearance of the N=20 shell closure in the so-called "island of inversion" around <sup>32</sup>Mg is one of the most striking examples of the strength of nucleon-nucleon correlations. In this region, the quadrupoledeformed intruder configuration (based on a multi-particle multi-hole configuration) becomes the ground state, subverting the expected shell ordering predicted by a harmonic oscillator plus spin-orbit term. The odd N=21 isotones therefore yield the possibility of a direct investigation of the ordering between single-particle and intruder states along the same chain, although experimental study of such nuclei becomes increasingly difficult with decreasing Z. Available spectroscopic evidence suggests that in <sup>37</sup>S the single-particle and collective intruder configurations are strongly connected, thus placing <sup>37</sup>S at the upper edge of the island of inversion. However, information on observables directly related to the wavefunction composition is rather scarce. The first excited state ( $3/2^{-}$  state at 646 keV) is the only one with a measured lifetime, but no transition probability has been firmly determined for intruder states, in particular those connected with strong branching ratios to the a priori spherical single-particle states.

A combined DSAM+RDDS measurement has been performed to measure such transition probabilities, in particular for the  $3/2^+$  state at 1397 keV (1p-1h nature) and the  $7/2^-$  at 2023 keV (2p-2h nature), exploiting the full performance of the AGATA spectrometer in terms of energy and angular resolutions. The <sup>37</sup>S nucleus has been produced via the <sup>36</sup>S(d,p) reaction in inverse kinematics, detecting the recoiling protons in SPIDER to obtain an accurate reconstruction of the excitation energy of <sup>37</sup>S.

This contribution will show the status of the analysis and some preliminary results obtained so far

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