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Properties of low-lying intruder states in 34Al and 34Si populated in the beta-decay of 34Mg

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The results of the IS530 experiment at ISOLDE revealed new information concerning several nuclei close to the N¯20 'Island of Inversion' –34Mg, 34Al, 34Si. The half-life of 34Mg was found to be three times larger than the adopted value (63(1) ms instead of 20(10) ms). The beta-gamma spectroscopy of 34Mg performed in this experiment for the first time led to the first experimental level scheme for 34Al, also showing that the full beta strength goes through the predicted 1+ isomer in 34Al and/or excited states that deexcite towards it. The subsequent beta-decay of the 1+ isomer in 34Al allowed the observation of new gamma lines in 34Si, (tentatively) associated with low-spin high-energy excited states (most probably 1+, 2+) previously unobserved.

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