Transition probabilities in ^{31}S and ^{31}P: A test for isospin symmetry

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Abstract

Excited states in the mirror nuclei ^{31}S and ^{31}P were populated in the 1*n* and 1*p* exit channels, respectively, of the reaction ^{20}Ne+^{12}C, at an energy of 33 MeV. The beam of 20Ne was delivered for the first time by the Piave-Alpi accelerator of the Laboratori Nazionali di Legnaro. Angular correlations of coincident γ rays and Doppler-shift attenuation lifetime measurements in ^{31}S and ^{31}P were performed using the multi detector array GASP in conjunction with the EUCLIDES charged particle detector. As a result, the comparison of the determined B(E1) strengths of the analog mirror $7/2^- \rightarrow 5/2^+$ transitions was, for the first time, possible due to the low errors bars. The presence of a violation of isospin symmetry is proved.

Key Words: Mirror nuclei, measured lifetimes, transition probabilities, isospin symmetry

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