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Enhanced α-Transfer population of the 2^+_{ms} mixed-symmetry state in ^{52}Ti FUAD A. ALI[1], DENNIS MUECHER, VINZENZ BILDSTEIN, BEAU GREAVES, ALI. I. KILIC, Univ of Guelph, JASON D. HOLT, TRIUMF, CHRISTIAN BERNER, R. GERNHAEUSER, K. NOWAK, S. HELLGARTNER, R. LUTTER, S. REICHERT, Department of Physics, TU Munich — The residual nucleon-nucleon interaction plays a crucial role in nuclear structure physics. In spherical even-even nuclei the quadrupole interaction leads to so called proton-neutron mixed symmetry states, which are sensitive to the underlying subshell structure. We present new data using the MINIBALL germanium array. States in ^{52}Ti were populated via the α-transfer reaction ^{48}Ca(^{12}C,^{8}Be)^{52}Ti using a ^{48}Ca beam from the Maier-Leibnitz-Laboratory in Munich. In the frame work of IBM-2, Alonso *et al*. have shown that the population of the 2^+_{ms} state is strictly forbidden for the alpha transfer from a doubly magic nucleus. In contrast, we measured a large relative cross section into the 2^+_2 mixed-symmetry state in ^{52}Ti relative to the 2^+_1 state of 31.1(20)%. This value exceeds earlier measurements in the ^{140}Ba nucleus, representing the case of a particular strong population of the 2^+_{ms} state. This points towards effects of core polarizations of ^{48}Ca in the low-lying structure of ^{52}Ti. We have performed ab-initio shell model calculations to understand the origin of the discovered discrepancies.

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