

Shell Model Residual Interaction between Protons and Neutron Holes studied in ^{208}Bi

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Recently γ - γ -transitions and conversion electrons have been measured in ^{208}Bi with the $^{208}\text{Pb}(p,n)^{208}\text{Bi}$ reaction. This statistical compound reaction populates all levels of low to medium spin, independent of their structure. In earlier studies of the proton transfer to ^{207}Pb and the neutron pickup from ^{209}Bi multiplets of specific particle-hole structure have been identified and spectroscopic factors measured. The combined data give the level scheme of the one particle one hole states with firmly assigned spins and parities for 50 levels. Starting from the realistic H7B-interaction, the ^{208}Bi wave functions have been calculated and from them the measured properties, namely energies, spectroscopic factors and γ -branching ratios. The interaction elements, were then allowed to vary and have been determined by a least square fit of the data. The fitted interaction reproduces the measured data very well, particularly also the highly sensitive γ -branching ratios. It is compared with the H7B interaction and explored for characteristic patterns.