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Approaching complete spectroscopy of 208Pb

Content:
Proton scattering on 208Pb via isobaric analog resonances in 209Bi populates neutron particle-hole states in 208Pb. The spin and parity of the neutron particle correspond to the spin and the parity of the resonance. The resonance can be selected by adjusting the proton beam energy in the 208Pb(p,p') reaction. Spin and parity of the neutron holes can be determined from angular distributions of the 208Pb(p,p') reaction. The high resolution (3 keV) of the Q3D magnetic spectrograph in Munich allows to determine excitation energies in 208Pb up to 7.5 MeV with an absolute precision of a few 100 eV. Spin, parity and major particle-hole configuration of almost all states for Ex < 6.1 MeV are determined. (The shell model without residual interaction predicts 120 states of any parity.) About 80 negative parity states are identified for Ex < 6.5 MeV [1,2,3,4]. The structure of more than 30 positive parity states based on the j15/2 p1/2, j15/2 f5/2, j15/2 p3/2 states are determined for Ex < 6.0 MeV [5].


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