MIRROR SYMMETRY IN $^{53}_{27}Co_{26}$ AND $^{53}_{26}Fe_{27}$

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In two recent experiments the large gamma-ray spectrometer array, GAMMASPHERE, was used to identify gamma decays from high-spin states in the mirror-pair nuclei $^{53}_{27}Co_{26}$ and $^{53}_{26}Fe_{27}$. The reaction $^{32}S + ^{24}Mg \longrightarrow ^{56}Ni^*$ at a beam energy of 95MeV was used in the first instance, with reaction channel selection afforded by the FRAGMENT MASS ANALYSER recoil separator and an ion-chamber. In the second instance the reaction $^{32}S + ^{28}Si \longrightarrow ^{60}Zn^*$ at a beam energy of 125MeV was used, with channel selection provided by the MICROBALL light charged particle detector and NEUTRON SHELL neutron detector.

States up to the $f_{\frac{7}{2}}$-shell band termination of $J^\pi = \frac{19}{2}^-$ were identified in both A=53 mirror-pair nuclei, and the Coulomb Energy Difference (CED) was calculated as $Ex(^{53}Co)$-$Ex(^{53}Fe)$ for each level throughout the entire spin range. Changes in the CED will be interpreted in terms of non-collective particle alignment effects. The CED will also be compared to the results of large-scale shell-model calculations in the full-fp valence space. A discussion of the physical significance of the Coulomb Matrix Elements used in the calculations will be presented, and the results of a fit of the measured CED to these Matrix elements will be shown.