

**Title:** The Strange Case of  $^{229}\text{Pa}$ : Equivalent Atomic and Nuclear Energy Scales

**Abstract:** The octupole-deformed nucleus  $^{229}\text{Pa}$  is of interest because of the enhanced electric dipole moment (edm) that might result from the ground-state parity doublet.

The case is unique in that the splitting of the nuclear parity doublet is small compared to the relevant atomic energy scale, the average energy of E1 excitations in the atom. This leads to puzzling result for the internal conversion de-excitation of the upper state of the doublet. Similar effects may arise in computing the edm response of the atom.

Wick Haxton