The dynamical evolution of the parity splitting energy in nuclei with octupole deformation

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The dynamical features of the parity splitting phenomenon observed in the spectra of even-even and odd mass nuclei with strong octupole correlations is investigated within a collective model. Specific phenomenological insight is obtained form the model extensions adopted for the reproduction of the fine spectroscopic aspects in the experimental data, such as the staggering of the negative and parity states. The beat pattern of the higher order parity energy difference in even-even nuclei can therefore be generated by considering a more stabilized octupole deformation for the positive parity states. On the other hand, the staggering of the energy parity splitting in odd mass nuclei, which cannot be accounted by the Coriolis interaction in the strong coupling regime, is shown to emerge from an intermediate coupling regime simulated with an adjustable particle-core coupling. The proposed theoretical description is supported by numerical applications on medium and heavy nuclei.