Contribution ID: **40** Type: **Talk**

From shape coexistence to shape isomers in atomic nuclei

Monday, 2 May 2022 11:30 (30 minutes)

Shape coexistence occurs when the potential energy of the nucleus is characterized by local minima for different shapes. Excited states in the secondary minimum may become isomeric if the potential barrier separating the secondary minimum from the ground-state minimum is sufficiently pronounced. The first examples of such shape isomers were observed in the 1960s, as fission isomers in the actinides. They are located in a secondary minimum at very large deformation and excitation energies of several MeV. Fission is the predominant decay mode due to a strong potential barrier for gamma decay to the ground state.

In even-even nuclei, these shape isomers occur as an excited 0+ state residing in a secondary minimum as a false ground state. If located at high excitation energy (above 1-2 MeV) these states will usually not show up as long-lived states, although their reduced decay strength may still be considerably reduced. First excited 0+ states at low energy (below ~1 MeV) are very rare, and only known in a handful of stable nuclei. Research has been going on for several decades to find other examples in exotic nuclei far from nuclear stability.

In my presentation I will concentrate on the research of such low-lying shape isomers, with an emphasis on even-even mass nuclei, where the particularity of 0+ to 0+ E0 transitions to the nuclear ground state can be exploited.

Primary author: KORTEN, Wolfram (CEA Paris-Saclay)

Presenter: KORTEN, Wolfram (CEA Paris-Saclay)

Session Classification: Nuclear Structure II