

## Shapes, quartets and clusters in a semimicroscopic framework

**J. Cseh**<sup>1</sup>

<sup>1</sup>MTA ATOMKI, 4026 Debrecen Bem ter 18/C, Hungary

### Abstract

Recently we have invented a symmetry-adapted semimicroscopic framework, in which

- the stable shapes of the nucleus are obtained from the investigation of the stability and self-consistency of the quasi-dynamical SU(3) symmetry [1], and
- the shapes, quartets (shell-configurations) [2] and clusters (molecule-like configurations) [3] are connected by the multichannel dynamical symmetry [4], that has a strong predictive power [5].

In this contribution we discuss how symmetry-considerations provide us with the complete landscape of the shape isomers and the details of the spectrum.

### References

- [1] J. Cseh et al, *Phys. Rev. C* **80** (2009) 034320; **84** (2011) 024302; **86** (2012) 064309.
- [2] J. Cseh, *Phys. Lett. B* **743** (2015) 213.
- [3] J. Cseh, *Phys. Lett. B* **281** (1992) 173;  
J. Cseh and G. Lévai, *Ann. Phys. (NY)* **230** (1994) 165.
- [4] J. Cseh, *Phys. Rev. C* **50** (1994) 2013;  
J. Cseh and K. Kato, *Phys. Rev. C* **87** (2013) 067301.
- [5] J. Cseh and G. Riczu, *Phys. Lett. B* **757** (2016) 312.