

Service de Physique Nucléaire



Séminaire

le vendredi 13 décembre 2013 à 11h00

CEA Saclay, Orme des Merisiers, Bât. 703, Salle 135

It's all gone pear-shaped : octupole-deformed nuclei studied via Coulomb excitation

Liam Gaffney

Catholic University, Leuven, Belgium

Deformation in nuclei is common, and axial- and reflection-symmetric quadrupole shapes are prevalent across the chart of nuclides. There exists strong circumstantial evidence, however, that some (Z,N) combinations will give rise to octupole deformation, or a reflection-asymmetric pear-like shape. The actinides are expected to possess the strongest octupole collectivity however, only ^{226}Ra with its relatively long lifetime of 1600 years has had its octupole collectivity quantified.

With the advent of radioactive ion beams and in particular, the ability to post-accelerate the heavy elements radon and radium at REX-ISOLDE, we recently overcame challenges limiting our knowledge in this region[1]. Coulomb excitation was successfully performed on ^{220}Rn and ^{224}Ra and E1, E2 and E3 matrix elements have been determined. The results are not only significant for nuclear structure, but also on the search for atomic electric-dipole moments (EDMs), which are predicted to be enhanced by octupole deformation.

In this seminar I discuss octupole deformation in nuclei and present the results of recent experiments as well as outlining plans for the future. The consequence of our results on on-going experiments looking for EDMs to test the Standard Model will also be discussed.

[1] <http://www.nature.com/nature/journal/v497/n7448/full/nature12073.html>

Le café sera servi 10 minutes avant

Contact : Magda.Zielinska@cea.fr Tel : 01 69 08 74 59
http://irfu-i.cea.fr/Phocea/Vie_des_labos/Seminaires/index.php