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How to determine the shape of nuclear molecules with polarized gamma-rays

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A method has been recently proposed on Phys.Rev. C 99 (2019) 031302 to establish the geometry of the alpha-cluster arrangement in ^{12}C making use of polarized gamma-rays. The ratio of intensities of scattered radiation at 90 degree along and perpendicular to the initial direction of the electric field vector, called depolarization ratio, is a key quantity that allows to underpin the nature of totally symmetric modes of vibrations. This allows to connect with the underlying point-group structure and therefore to the geometric shape of the nuclear molecule.

This method is reviewed for ^{12}C and extended to other configurations, such as three unequal clusters and four identical clusters (e.g. ^{16}O).

Author: FORTUNATO, Lorenzo (1) University of Padova and 2) I.N.F.N.- Padova)

Presenter: FORTUNATO, Lorenzo (1) University of Padova and 2) I.N.F.N.- Padova)

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