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Nuclear structure inputs to constrain the symmetry energy –The complex pattern of the pygmy resonance

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The pygmy dipole resonance (PDR) is a vibrational mode described as the oscillation of a neutron skin against a core symmetric in number of protons and neutrons. The PDR has been the subject of numerous studies, both experimental and theoretical [1,2,3]. Indeed, the study of the PDR has been and still is of great interest since it allows to constrain the symmetry energy, an important ingredient of the equation of state of nuclear matter that describes the matter within neutron stars [4]. However, despite numerous experiments dedicated to the study of the PDR, a consistent description is still discussed. In this context, various experimental approaches have been tried out. In particular, we have proposed to study the PDR using a new probe: the neutron inelastic scattering reaction (n,n'g). This type experiment is now feasible thanks to the high-intensity proton beam of the new accelerator SPIRAL2 at GANIL and the NFS (Neutron For Science) facility.

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