

From Nuclear Giant Resonances to Environmental Radiation Monitoring: Recent Research Activities and Perspectives for Collaboration.

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The Isoscalar Giant Monopole Resonance (ISGMR), often referred to as the nuclear “breathing mode,” provides essential constraints on the incompressibility of nuclear matter and therefore on the nuclear equation of state. In this contribution, recent investigations of the ISGMR strength distribution and its fine structure obtained through high-resolution inelastic scattering measurements will be presented. Particular emphasis will be placed on the extraction and interpretation of fine-structure features and their relation to underlying nuclear dynamics and decay mechanisms.

These studies were carried out within the framework of nuclear structure research activities at iThemba LABS and contributed to a better understanding of collective excitations in nuclei.

In addition, a brief overview will be given of ongoing research directions at Laboratoire de Physique Corpusculaire de Caen related to environmental radiation measurements and the development of innovative portable low-cost detector systems for environmental monitoring applications. Possible avenues for future collaboration between the South African and French teams in this field will also be discussed.

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