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Fine structure of the isovector Giant Dipole Resonance in neutron-rich calcium isotopes using the (p,p') reaction at 200 MeV

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Abstract content
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Proton inelastic-scattering experiments have been carried out on the neutron-rich isotopes of calcium, 42,44,48Ca at zero-degrees using the high-energy resolution K600 Magnetic Spectrometer of iThemba LABS with a view to investigating the fine structure in the region of the Isovector Giant Dipole Resonance (IVGDR). Excellent energy resolutions were achieved with ΔE(FWHM)≈ 30 KeV for 44Ca and ΔE(FWHM)≈ 40 KeV for 42,48Ca leading to clear observation of fine structure thus allowing for an understanding of the damping of the resonance by comparison with state-of-the-art microscopic theoretical calculations. Double differential cross-sections have been extracted from the data obtained for each of the isotopes. Equivalent photo-absorption cross-sections were obtained from the measured data using virtual-photon production rates which agree well with those photo-absorption cross-sections already reported in the literature. In addition, preliminary results of the extracted characteristic energy scales are presented and future prospects are discussed.

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PhD

Main supervisor (name and email)
and his / her institution

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