

UNIVERSITY OF NOTRE DAME  
DEPARTMENT OF PHYSICS

# NUCLEAR SEMINAR

Monday, February 8

## *Examining nuclear shell structure effects on isoscalar giant monopole resonance and nuclear incompressibility near $A \sim 90$*

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Nuclear incompressibility is a fundamental quantity characterizing the equation of state (EOS) of nuclear matter. Experimentally, it may be determined from the compressional “breathing mode” of nuclear density oscillation, the isoscalar giant monopole resonance (ISGMR) in finite nuclei. Analyses of the ISGMR have implied that the determination of nuclear incompressibility is independent of the choice of the nucleus, provided that approximately 100% energy weighted sum rule (EWSR) fraction is exhausted in the ISGMR peak; this condition is satisfied for sufficiently heavy nuclei ( $A > 90$ ).

In a recent work from Texas A & M group, it was claimed that the ISGMR strength distributions vary in a dramatic manner in nuclei near  $A \sim 90$  region. In particular, the  $A=92$  nuclei,  $^{92}\text{Zr}$  and  $^{92}\text{Mo}$ , emerged quite disparate from the others. These results, if correct, imply significant nuclear structure contribution to the nuclear incompressibility in this mass region. To further examine these surprising and highly intriguing results, inelastic scattering of 385-MeV  $\alpha$  particles has been measured on  $^{90, 92}\text{Zr}$  and  $^{92}\text{Mo}$  nuclei using the “Grand Raiden” spectrometer at RCNP, Japan. Results obtained from multipole decomposition analysis would be discussed.

**4 pm – 5 pm**  
**Nuclear Science**  
**Laboratory**  
**124 Nieuwland**  
**Science Hall**

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All interested  
persons are  
cordially invited  
to attend

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Refreshments will be  
served prior to the  
seminar in room 124