Nuclear Seminar

The photonuclear cross section of Boron-10 from the No Core Shell Model

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Monday

April 27

4 P.M.

Rm 124 NSH

In this talk I will outline how I have started to build a framework to calculate electroweak observables in the ab-initio No Core Shell Model. Electromagnetic probes provide stringent tests of the predictive power of our nuclear Hamiltonians and can be used to constrain potential models whereas weak observables can answer interesting questions about the nature of the universe. As a starting point, I have calculated the photonuclear cross section of Boron-10 using as input realistic nuclear interactions to determine the ground- and excited-states of the nucleus. By using the moment-generating method of Lanczos one is able to construct the electric-dipole strength function from which one can calculate the energy-weighted strength function. To determine the cross section one needs to take into account the finite width of the continuum states; in our case we use the physics of neutron-escape widths, which will be extensively discussed. Theoretical results are compared to experimental data and some results regarding the Brink hypothesis will be presented.

Refreshments served prior to the seminar in Rm 124.

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