

Near Threshold resonance in ^{11}B and the puzzle of an exotic decay.

September 25, 2023

The study of near-threshold resonances in weakly bound systems is an exciting topic in experimental and theoretical nuclear physics since they provide important information on the interaction of discrete states with the continuum. Recent theoretical developments aim to describe the continuum interaction. However, questions on the behavior, structure, and properties of the many-body systems close to the particle emission threshold remain open, making the experimental studies of near-threshold states and its characteristics crucial for constraining the theoretical efforts. In particular, a near-threshold proton resonance in ^{11}B has long been sought since it would provide a less exotic explanation to the controversial observation of the unexpectedly large β -p+ branching ratio in ^{11}Be . In this talk, I will discuss two recent experiments carried out at the John D. Fox Superconducting Linear Accelerator Laboratory at Florida State University. In the first one, a near-threshold proton state was observed at a resonance energy of 211 keV in ^{11}B via the $^{10}\text{Be}(d,n)^{11}\text{B}$ reaction. Preliminary results from a second experiment realized using the Enge Split-Pole Spectrograph (SPS) at FSU where the alpha decay from ^{11}B was studied with the $^7\text{Li}(^7\text{Li},t)^{11}\text{B}$ reaction will also be presented.