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Determination of the neutron $0d_{3/2}$ strength in ^{17}C .

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The evolution of the $N=16$ shell gap in neutron-rich oxygen isotopes has been studied extensively over the past years [1, 2, 3, 4]. In neutron-rich carbon isotopes, the $N=14$ shell gap is shown to collapse [5, 6] however no experimental information on the $N=16$ shell gap is known. Unbound states in ^{17}C have been populated using one-neutron transfer reaction $d(^{16}\text{C},p)^{17}\text{C}$ at a beam energy of 17.2 AMeV [6] with the TIARA Silicon array at GANIL. The excitation energy of the neutron unbound states in ^{17}C was reconstructed using the information from the energy and angle of the proton ejectile. Some resonances have been found and their neutron-decay widths were deduced. The results are compatible with a large strength of the $0d_{3/2}$ orbital involved in the development of the $N=16$ shell gap. In this talk, I will present the preliminary results and discuss them in the light of recent shell model calculations.

References:

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Topic

Experiment

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