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Search for d3/2 single particle strength in 15N in Unbound Levels[1] C.E. MERTIN, D.D. CAUSSYN, A.M. CRISP, Florida State University, N. KEELEY, Soltan Institute, Warsaw, Poland, K.W. KEMPER, O. MOMOTYUK, B.T. ROEDER, A. VOLYA, Florida State University — The population of states in the nucleus 15N provides the opportunity to investigate both single particle and cluster structures in the 1p and 2s1d shells. Single, two, three and four particle transfer reactions selectively excite states in 15N thus providing a way to explore current nuclear structure models. Narrow structures are observed in the various transfer reactions up to at least 20 MeV in excitation well above the neutron (10.8 MeV) and proton (10.2 MeV) separation energies. In the present work new results for the reaction 14N(d,p) are presented that explore possible single particle strengths up to 18 MeV in excitation. The beam energies used in the present work were between 10.5 and 16 MeV. An early work with a beam energy of 8 MeV clearly populated strong sharp levels at 10.07 and 11.23 MeV and the present work confirms their existence. In addition, very weak broader levels are populated at 12.13 and 12.5 MeV but no other structures are found experimentally at higher excitation energies. The results of shell model calculations that include the 1p and 2s1d shells will be presented. The centroid energies for the 1d5/2 and 2s1/2 single particle strength have been obtained through comparison with FRESCO calculations.

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