Sorting neutron resonances by spin groups using a machine learning technique.[1] PEDRO RODRGUEZ FERNNDEZ, University of Puerto Rico Mayagez Campus, SOPHIA HOLLICK, University of Yale, DAVID BROWN, GUSTAVO NOBRE, Brookhaven National Lab, WE TEAM — The nuclear level density is a key input for modeling nuclear reactions. The most discriminative constraint on the level density is the level spacing at the neutron separation energy, D. Efforts such as the Reference Input Parameter Library (RIPL) and the Atlas of Neutron Resonances, have compiled the average level spacing of most known isotopes. Because of the challenge of classifying every neutron resonance in the correct spingroup, the values of the average spacings compiled in these two resources differ. This project focuses on the first steps of the development of a machine learning technique, to try and resolve this classification problem. Initial results using random matrix theory motivated fits to the Nearest Neighbor Spacing Distribution (NNSD) demonstrated that we can determine resonance spin group somewhat reliably.

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