

The global proliferation of nuclear weapons and nuclear material has highlighted the importance of being able to locate and identify special nuclear material. Recently, our group has developed the H2DPI system, that, using a combination of neutron and gamma ray coincidence measurements, can accurately image radioactive sources. Our group has developed an MCNP simulation of the H2DPI system so that we can train machine learning code based on data gathered from sources in specific directions more efficiently. The accuracy of this model is very important to the work that we do, and as such we need to verify and validate the simulation results. We have been working on the analysis of the MCNP generated data in comparison with the analysis of data we gathered experimentally to make sure that our simulation is as accurate as possible in reference to the actual H2DPI system. We will present our verification and validation results for our simulation model as well as the process used to verify and validate the results, specifically we will show and compare the neutron spectra plots generated by both the simulation and the experiment when using a Cf252 source.