NE250 Summary 8 **Mitch Negus**
10/20/2017

Resonance Self-Shielding Methodologies in SCALE6

M. Williams

This week's article discusses the methodology used by SCALE6 to generate self-shielding corrections. The article mentions how most generic cross section libraries are not necessarily sufficient for problems with complex structures. One reason for this is that effects like self-shielding have nontrivial effects on the standard cross sections in various types of problems, and locations in those problems. To account for these effects, SCALE incorporates methods to improve the cross sections. When these corrections are less complicated, such as at higher energies or in fairly uniform geometries, SCALE uses the Bondarenko method (via the BONAMI code) to calcualate the self-shielding. This method is fast, however it is not as accurate as more sophisticated treatments. In regions where this technique is not adequate, SCALE employs CENTRM to generate more accurate neutron spectra. These results are passed to the Prepare Multigroup Cross Sections (PMC) module to replace the BONAMI self-shielding values.

The article addressed a facet of simulation which I think is not as frequently discussed and yet is critical to reactor simulations. Without appropriate nuclear data, simulations of nuclear phenomena are completely ineffective. Moreover, the handling of cross sections on a problem-by-problem basis like this allows generic cross section libraries to be easily tabulated and distributed, with corrections made as they arise, rather than requiring all problem-specific parameters be tabulated as well. I do think this paper might have been better served with a more clear and concise form, perhaps devoting slightly more time to explaining motivation (such as the negative effects of improperly handling self-shielding), and including references to the SCALE manual when appropriate. Instead, *this* article seemed to read like a theory manual.