

Florida State University
Planning Grant: Enhanced Thermal Performance and Microstructure Simulation of Nuclear Fuels

PI: Justin Schwartz

Description: The objective of this proposal is to perform preliminary investigations to determine the viability of improved oxide nuclear fuels through high thermal conductivity coatings such as “BeO.” To meet Florida’s sustainable energy demands, we will pursue the option of enhanced oxide nuclear fuel performance by considering the potential for improved thermal behavior through high thermal conductivity oxide coatings. This work will include a literature search of past investigations of the impact of enhanced thermal conductivity on nuclear fuel and reactor performance, the temperature and irradiation dependence of the thermal conductivity of BeO and other high thermal conductivity oxides, the chemical and thermal compatibility of BeO and nuclear fuels (UO₂, PuO₂, ThO₂ and MOX), and initial studies into BeO coatings on HfO₂ particles, where HfO₂ serves as a benign surrogate for nuclear fuel oxides. We will conduct an evaluation of possible coating processes and measure their thermal behavior. We will use these findings to pursue external funding.

Budget: \$15,000

Progress Summary

Project is complete. Dr. Schwartz Submitted one proposal through the MAGLAB without IESES. Subsequently Dr. Swartz left FSU service in the summer of 2009.