# Evaluation of the Thermal Scattering Law for
# Advanced Reactor Neutron Moderators and Reflectors

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**ABSTRACT:**


The objective of this project is to narrow the nuclear data gap for advanced nuclear reactors that are driven by thermal neutrons.  This includes concepts such as gas cooled high temperature reactors and molten salt or salt cooled high temperature reactors.  For such reactors, a primary class of nuclear data is the thermal neutron scattering law (TSL), i.e., $S(\alpha,\beta)$, for moderators, reflectors and internal structure (e.g., nuclear/reactor graphite and/or carbon-carbon composites), and coolants (e.g., FLiBe molten salt). To date, such data is either completely missing or exists in an approximate or inappropriate form. Consequently, this proposal will leverage the capabilities and knowhow of the primary university group working in this field to provide TSL evaluations for FLiBe liquid salts and carbon-carbon composites, which are currently missing and are required for advanced reactor development and upgrade the TSL evaluations for nuclear/reactor graphite (including the latest version released within ENDF/B-VIII.0) to include improved temperature behavior using temperature dependent phonon spectra.  The generated data TSL libraries will be provided in EDNF File 7 format to the National Nuclear Data Center (NDDC) to immediately include in beta releases of the ENDF/B libraries and to consider for the future release of ENDF/B-VIII.1.