From: Alford, Angela C.
To: Weaver, Deborah J.; NST_DIV; NSTD_Students; GNST_Div; GNSTD_Students;
Subject: RE: Seminar Announcement - June 11 - Deokjung Lee
Date: Wednesday, June 10, 2009 7:20:15 AM

The Impact of ^{238}U Resonance Elastic Scattering Approximations on Thermal Reactor Doppler Reactivity

Deokjung Lee

Studsvik Scandpower, Inc.

Thursday, June 11, 2009, 2:00 PM, Research Office Building (5700), Rm. O304

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Abstract

The effects of accurate modeling of neutron scattering in ^{238}U resonances are analyzed for typical light water reactor (LWR) and next generation nuclear plant (NGNP) lattices. An exact scattering kernel is formulated and implemented in a newly developed Monte Carlo code, MCSD (Monte Carlo Slowing Down), which solves a neutron slowing down in an infinite homogeneous medium and is used to generate resonance integral data used in the CASMO-5 lattice physics code. It is shown that the exact scattering kernel increases LWR Doppler coefficients by ~10% relative to the traditional assumption of asymptotic elastic downscatter for ^{238}U resonances. These resonance modeling improvements are shown to decrease hot full power eigenvalues by ~200 pcm for LWRs and ~450 pcm for NGNPs.