# AN AEROSOL RESUSPENSION MODEL FOR MELCOR FOR FUSION

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The MELCOR code [1] is currently under development at the Sandia National Laboratory (SNL) for the US Nuclear Regulatory Commission (NRC). MELCOR is used to model the progression of severe accidents in light water nuclear reactors. Fusion specific modifications to MELCOR by the Fusion Safety Program (FSP) organization at the Idaho National Laboratory (INL) began during the Engineering Design Activity (EDA) of the International Thermonuclear Experimental Reactor (ITER), when MELCOR 1.8.2 was selected for performing ITER safety analyses [2]. A primary reason for this selection is MELCOR's radionuclide and aerosol transport capabilities. Additional modifications to this fusion version of MELCOR have been made over the subsequent years [3]. Recent efforts have resulted in the implementation of an aerosol resuspension model for MELCOR 1.8.5 for Fusion. This paper presents the resuspension models adopted and the initial benchmarking of these models.

The particle resuspension models developed by References [4, 5] were selected for MELCOR for Fusion. These resuspension models are based on a kinetic energy balance between the particle surface adhesion force and the viscous shear forces applied by a fluid on a deposited particle. These forces induce particle oscillations that, if rapid enough, result in particle liftoff from the surface. Fig. 1 shows the results of the Reeks and Hall model (designated as the Rock'n Roll model), applied by Reeks and Hall to their data and that obtained from the non-resonance energy transfer variant of this model selected for MELCOR. As can be seen, agreement between the authors' original prediction, their data, and the model for MELCOR is very satisfactory.

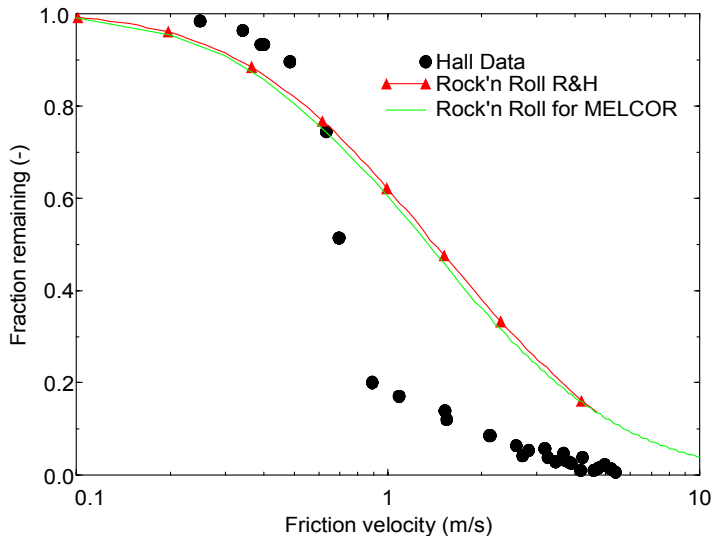


*Figure 1: Benchmark results for MELCOR resuspension model*

[1] R. O. Gauntt, et al., NUREG/CR-6119, 1, Rev.3, Sandia National Laboratory (2005)
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[3] B. J. Merrill, et al., Fusion Engineering and Design, 84 (2009) 1285-1288
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