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# Improvement of Model for SIMMER Code for SFR Corium Relocation Studies

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**Abstract :** The in-depth understanding of severe accident propagation in Generation IV of nuclear reactors is important so that appropriate risk management can be undertaken early in their design process. This paper is focused on model improvements in the SIMMER code in order to perform studies of severe accident mitigation of Sodium Fast Reactor. During the design process of the mitigation devices dedicated to extraction of molten fuel from the core region, the molten fuel propagation from the core up to the core catcher has to be studied. In this aim, analytical as well as the complex thermo-hydraulic simulations with SIMMER-III code are performed. The studies presented in this paper focus on physical phenomena and associated physical models that influence the corium relocation. Firstly, the molten pool heat exchange with surrounding structures is analysed since it influences directly the instant of rupture of the dedicated tubes favouring the corium relocation for mitigation purpose. After the corium penetration into mitigation tubes, the fuel-coolant interactions result in formation of debris bed. Analyses of debris bed fluidization as well as sinking into a fluid are presented in this paper.

**Keywords :** corium, mitigation tubes, SIMMER-III, sodium fast reactor
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