

反应堆工程

ADS散裂靶件内部自由界面形态的数值模型分析

柴翔; 苏冠宇; 程旭

上海交通大学 核科学与工程学院, 上海200240

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摘要 加速器驱动的次临界系统(ADS)内部的散裂靶件通过加速器装置耦合次临界堆芯。无窗靶件的设计需保证自由界面有着稳定且理想的形状,以避免液态重金属局部过热。为研究无窗靶件内部自由界面的形态,本工作基于开源CFD计算平台OpenFOAM,使用VOF(volume of fluid)方法追踪自由界面,对无窗靶件内部自由界面的形态和特性进行数值模拟,并将结果与商用软件FLUENT计算结果和实验结果进行对比。同时比较多种湍流模型对计算的影响,推荐出较合适的湍流模型。

关键词 [自由界面](#) [VOF方法](#) [湍流模型](#) [OpenFOAM](#)

分类号

Numerical Model Simulation of Free Surface Behavior in Spallation Target of ADS

CHAI Xi ang; SU Guan-yu; CHENG Xu

School of Nuclear Science and Engineering, Shanghai Jiao Tong University, Shanghai 200240, China

Abstract The spallation target in accelerator driven sub-critical system (ADS) couples the subcritical reactor core with accelerator. The design of a windowless target has to ensure the formation of a stable free surface with desirable shape, to avoid local overheating of the heavy liquid metal (HLM). To investigate the free surface behavior of the spallation target, OpenFOAM, an opened CFD software platform, was used to simulate the formation and features of the free surface in the windowless target. VOF method was utilized as the interface-capturing methodology. The numerical results were compared to experimental data and numerical results obtained with FLUENT code. The effects of turbulence models were studied and recommendations were made related to application of turbulence models.

Key words [free surface](#) [VOF method](#) [turbulence model](#) [OpenFOAM](#)

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