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# Analysis of Void Fraction Distribution and Departure from Nucleate Boiling in Single Subchannel and Bundle Geometries Using Subchannel, System, and Computational Fluid Dynamics Codes

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In order to assess the accuracy and validity of subchannel, system, and computational fluid dynamics codes, the Paul Scherrer

Institut has participated in the OECD/NRC PSBT benchmark with the thermal-hydraulic system code TRACE5.0 developed by

US NRC, the subchannel code FLICA4 developed by CEA, and the computational fluid dynamic code STAR-CD developed by

CD-adapco. The PSBT benchmark consists of a series of void distribution exercises and departure from nucleate boiling exercises.

The results reveal that the prediction by the subchannel code FLICA4 agrees with the experimental data reasonably well in both

steady-state and transient conditions. The analyses of single-subchannel experiments by means of the computational fluid dynamic

code STAR-CD with the CD-adapco boiling model indicate that the prediction of the void fraction has no significant discrepancy

from the experiments. The analyses with TRACE point out the necessity to perform additional assessment of the subcooled boiling

model and bulk condensation model of TRACE

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