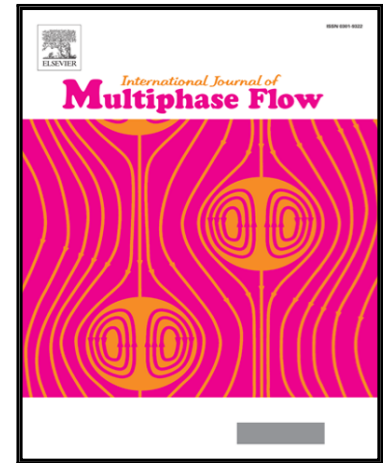


## Accepted Manuscript

Homogeneous Two-Phase Flow Models and Accurate Steam-Water Table Look-up Method for Fast Transient Simulations

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**Highlights**

- Algorithm for the efficient and very accurate calculation of water properties when the independent variables of the Equation of State are the density and the specific internal energy.
- Description of metastable states using IAPWS-IF97 Equation of State.
- Description of the spinodal curve as limit of metastable states for liquids and comparison with the spinodal curves of other equations of state presented in the literature.
- Validation of the Homogeneous Equilibrium Model (HEM) and the Homogeneous Relaxation Model (HRM) for rapid depressurizations and water-hammer.
- Benchmark of relaxation time correlations on experimental data of depressurizations.

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