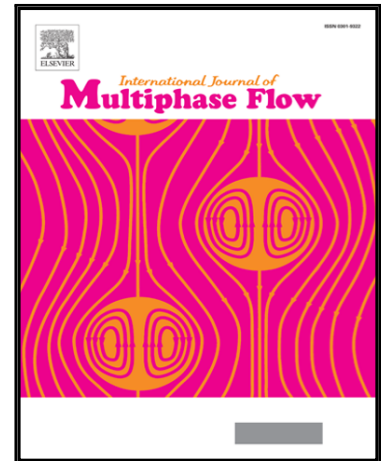


Accepted Manuscript

Analysis of time integration methods for the compressible two-fluid model for pipe flow simulations

Benjamin Sanderse, Ivar Eskerud Smith, Maurice H.W. Hendrix

PII: S0301-9322(17)30108-8
DOI: [10.1016/j.ijmultiphaseflow.2017.05.002](https://doi.org/10.1016/j.ijmultiphaseflow.2017.05.002)
Reference: IJMF 2592



To appear in: *International Journal of Multiphase Flow*

Received date: 9 March 2017
Revised date: 9 May 2017
Accepted date: 15 May 2017

Please cite this article as: Benjamin Sanderse, Ivar Eskerud Smith, Maurice H.W. Hendrix, Analysis of time integration methods for the compressible two-fluid model for pipe flow simulations, *International Journal of Multiphase Flow* (2017), doi: [10.1016/j.ijmultiphaseflow.2017.05.002](https://doi.org/10.1016/j.ijmultiphaseflow.2017.05.002)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Highlights

- BDF2 is proposed as time integration method for the two-fluid model.
- A thorough analysis of the accuracy and stability of time integration methods via eigenvalue analysis of the continuous, semi-discrete and fully-discrete equations is performed.
- An automated von Neumann analysis for the fully discrete equations that circumvents analytical derivations is developed, which can be easily employed if the two-fluid model is extended or different discretization methods are used.
- Discrete Flow Pattern Maps are proposed, which determine whether the effective well-posed unstable flow regime as determined by the discretization method matches the theoretical regime.
- Wave growth under well-posed unstable conditions can easily lead to ill-posed conditions, possibly limiting the applicability of the two-fluid model for slug-capturing simulations.

Download English Version:

<https://daneshyari.com/en/article/4994874>

Download Persian Version:

<https://daneshyari.com/article/4994874>

[Daneshyari.com](https://daneshyari.com)