

Accepted Manuscript

Truncation effect on Taylor–Aris dispersion in lattice Boltzmann schemes: Accuracy towards stability

Laetitia Roux, Irina Ginzburg

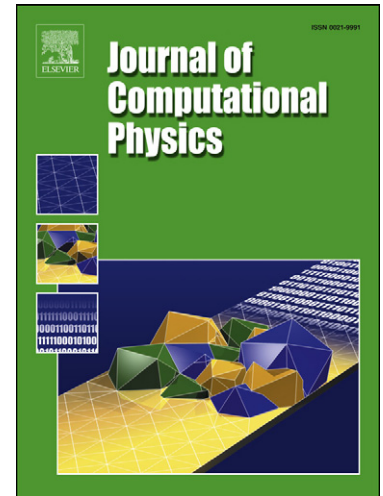
PII: S0021-9991(15)00462-3
DOI: <http://dx.doi.org/10.1016/j.jcp.2015.07.017>
Reference: YJCPH 6000

To appear in: *Journal of Computational Physics*

Received date: 11 November 2014
Revised date: 26 May 2015
Accepted date: 9 July 2015

Please cite this article in press as: L. Roux, I. Ginzburg, Truncation effect on Taylor–Aris dispersion in lattice Boltzmann schemes: Accuracy towards stability, *J. Comput. Phys.* (2015), <http://dx.doi.org/10.1016/j.jcp.2015.07.017>

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

- Closed analytical form is derived for truncation dispersivity of the d2Q9 advection-diffusion LBM scheme.
- In higher Péclet-range, its relative contribution to Taylor result becomes Pe- and velocity-independent.
- Numerical dispersivity vanishes for equilibrium-velocity-weight dependent solution of free eigenfunction product in two-relaxation-times (TRT) collision.
- Analytically predicted longitudinal dispersivity is in excellent agreement with the numerical experiments.
- The d2Q5 TRT bounce-back scheme achieves maximum accuracy for most stable relaxation parameters.

Download English Version:

<https://daneshyari.com/en/article/6931220>

Download Persian Version:

<https://daneshyari.com/article/6931220>

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