# Accepted Manuscript

An adaptive moving mesh method for thin film flow equations with surface tension

Abdulghani Alharbi, Shailesh Naire

PII: S0377-0427(17)30040-7
DOI: http://dx.doi.org/10.1016/j.cam.2017.01.019
Reference: CAM 10984

To appear in: *Journal of Computational and Applied Mathematics*

Received date: 12 April 2016
Revised date: 1 December 2016

Please cite this article as: A. Alharbi, S. Naire, An adaptive moving mesh method for thin film flow equations with surface tension, *Journal of Computational and Applied Mathematics* (2017), http://dx.doi.org/10.1016/j.cam.2017.01.019

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.

ACCEPTED MANUSCRIPT

1. We have successfully applied a $r$-adaptive moving mesh method based on MMPDEs and mesh density functions to a coupled system of higher order parabolic PDEs. To our knowledge this is the first attempt to implement $r$-adaptive schemes to such PDEs.

2. Numerical experiments show the adaptive moving mesh method to accurately resolve the multiple one-dimensional structures observed in the test problems. Moreover, it also reduces the computational effort in comparison to the numerical solution using the finite difference scheme on a fixed uniform mesh.

3. A significant result is related to adaptation of the curvature mesh density function to accurately resolve the solution at multiple locations using piecewise constant weight parameters.

4. We have also adapted the curvature mesh density function to include multiple solution components. This enabled us to accurately resolve the complicated multiple structures in the solution components compared to numerical solutions using a uniform mesh.

ACCEPTED MANUSCRIPT

Download English Version:

https://daneshyari.com/en/article/5776390

Download Persian Version:

https://daneshyari.com/article/5776390

Daneshyari.com