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Fabulous, flowing, and folding fountain of chocolate

Lyes Kahouadji, Seungwon Shin, Jalel Chergui, Damir Juric, Richard Craster,
Omar Matar

► **To cite this version:**

Lyes Kahouadji, Seungwon Shin, Jalel Chergui, Damir Juric, Richard Craster, et al.. Fabulous, flowing, and folding fountain of chocolate. 72th Annual Meeting of the APS Division of Fluid Dynamics, Nov 2019, Seattle, United States. American Physical Society, 10.1103/APS.DFD.2019.GFM.P0019 . hal-04401604

HAL Id: hal-04401604

<https://hal.science/hal-04401604>

Submitted on 18 Jan 2024

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Fabulous, flowing, and folding fountain of chocolate

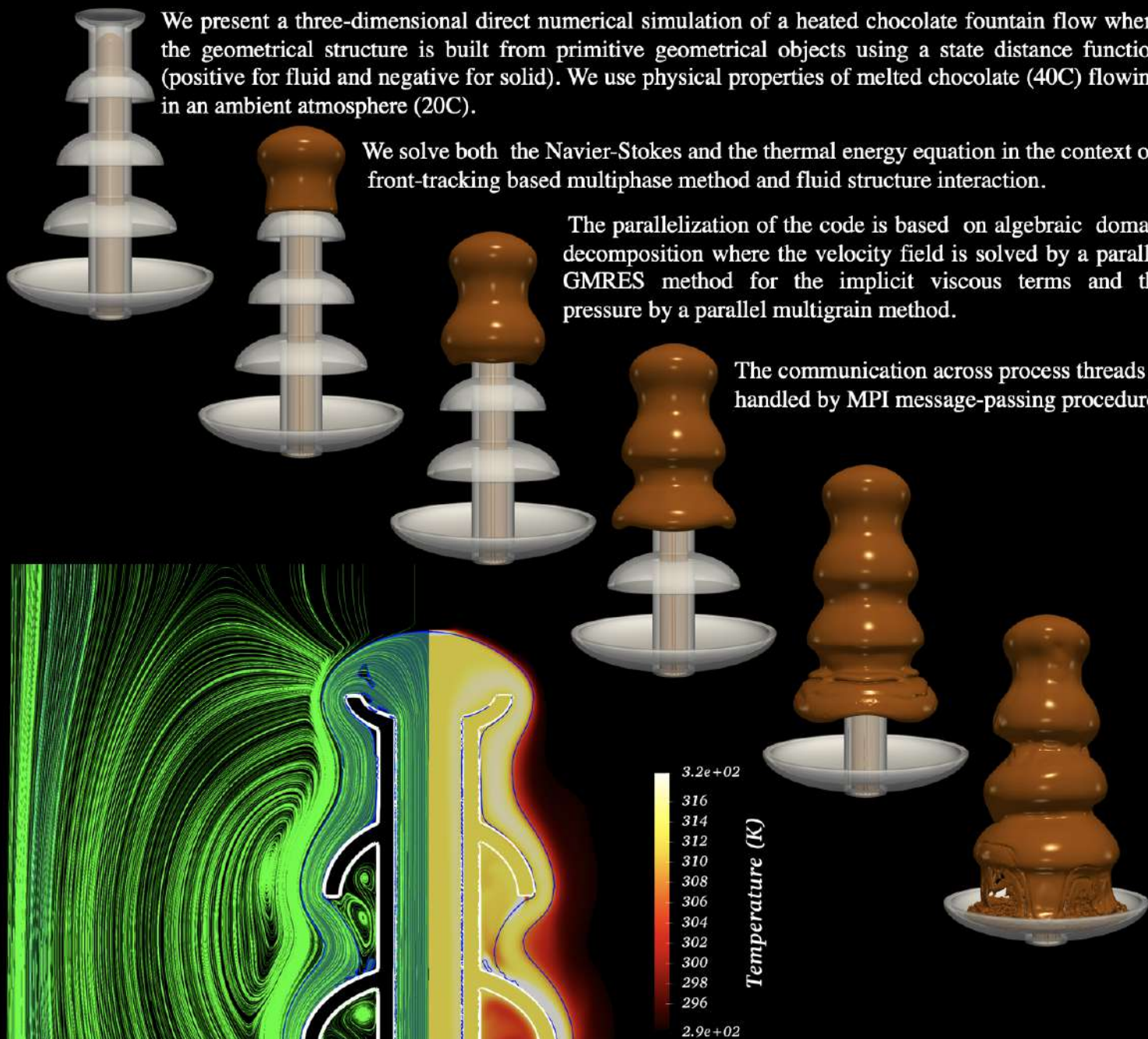
L. Kahouadji, S. Shin, J. Chergui, D. Juric, R. V. Craster, and O. K. Matar

We present a three-dimensional direct numerical simulation of a heated chocolate fountain flow where the geometrical structure is built from primitive geometrical objects using a state distance function (positive for fluid and negative for solid). We use physical properties of melted chocolate (40C) flowing in an ambient atmosphere (20C).

We solve both the Navier-Stokes and the thermal energy equation in the context of a front-tracking based multiphase method and fluid structure interaction.

The parallelization of the code is based on algebraic domain decomposition where the velocity field is solved by a parallel GMRES method for the implicit viscous terms and the pressure by a parallel multigrain method.

The communication across process threads is handled by MPI message-passing procedures.



Imperial College
London

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