



A model for red blood cells in simulations of large-scale blood flows

[Simone Melchionna](#)

(Submitted on 25 Jul 2011)

Red blood cells (RBCs) are an essential component of blood. A method to include the particulate nature of blood is introduced here with the goal of studying circulation in large-scale realistic vessels. The method uses a combination of the Lattice Boltzmann method (LBM) to account for the plasma motion, and a modified Molecular Dynamics scheme for the cellular motion. Numerical results illustrate the quality of the model in reproducing known rheological properties of blood as much as revealing the effect of RBC structuring on the wall shear stress, with consequences on the development of cardiovascular diseases.

Subjects: **Medical Physics (physics.med-ph)**; Soft Condensed Matter (cond-mat.soft); Biological Physics (physics.bio-ph)

Cite as: [arXiv:1107.4889](#) [physics.med-ph]
(or [arXiv:1107.4889v1](#) [physics.med-ph] for this version)

Submission history

From: Simone Melchionna [[view email](#)]
[v1] Mon, 25 Jul 2011 10:48:12 GMT (2401kb,D)

[Which authors of this paper are endorsers?](#)

Link back to: [arXiv](#), [form interface](#), [contact](#).

Download:

- [PDF](#)
- [Other formats](#)

Current browse context:

physics.med-ph

[< prev](#) | [next >](#)

[new](#) | [recent](#) | [1107](#)

Change to browse by:

[cond-mat](#)

[cond-mat.soft](#)

[physics](#)

[physics.bio-ph](#)

References & Citations

- [NASA ADS](#)

Bookmark([what is this?](#))

