



Nuclear Theory

A fully relativistic lattice Boltzmann algorithm

[P. Romatschke](#), [M. Mendoza](#), [S. Succi](#)

(Submitted on 6 Jun 2011)

Starting from the Maxwell-Juettner equilibrium distribution, we develop a relativistic lattice Boltzmann (LB) algorithm capable of handling ultrarelativistic systems with flat, but expanding, spacetimes. The algorithm is validated through simulations of quark-gluon plasma, yielding excellent agreement with hydrodynamic simulations. The present scheme opens the possibility of transferring the recognized computational advantages of lattice kinetic theory to the context of both weakly and ultra-relativistic systems.

Comments: 12 pages, 8 figures

Subjects: **Nuclear Theory (nucl-th)**; General Relativity and Quantum Cosmology (gr-qc); High Energy Physics - Phenomenology (hep-ph)

Cite as: [arXiv:1106.1093 \[nucl-th\]](#)
(or [arXiv:1106.1093v1 \[nucl-th\]](#) for this version)

Submission history

From: Paul Romatschke [[view email](#)]

[v1] Mon, 6 Jun 2011 15:25:25 GMT (188kb)

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

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

Download:

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

Current browse context:

nucl-th

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

[new](#) | [recent](#) | [1106](#)

Change to browse by:

[gr-qc](#)
[hep-ph](#)

References & Citations

- [INSPIRE HEP](#)
([refers to](#) | [cited by](#))
- [NASA ADS](#)

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

