

Answers to theory questions LB

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1 Pros and cons of LB

1.1 Pros

- Explicit update rule, no system of equations to solve.
 - Done by doing a trick. Introduce a new distribution function and see that the sum over states give the same global quantities.
- Easy to parallelize.
 - Each cell only depend locally on the neighbouring cells in the streaming step and only on itself in the collision.
- Simulating mesoscale
 - Unlike NS, LB looks at distributions of "bunches" of particles. May catch behaviour too fine for NS to detect.
- Can handle multiphase flows relatively easy.
 - Usually done by modifying the collision operator.

1.2 Cons

- Explicit update rule
 - Need small timesteps.
 - Finite propagation speed of information.
- Only using a square grid can be limiting.