Contribution ID: **110** Type: **not specified**

Towards learning a Lattice Boltzmann collisional operator

Monday, 19 December 2022 16:45 (20 minutes)

In this work we explore the possibility of learning a collisional operator
for the Lattice Boltzmann Method from data using a deep learning approach.
We present results where a Neural Network is successfully trained as a surrogate of the single relaxation time BGK operator.
We show that only by embedding in the Neural Network physical properties such as
conservation laws and symmetries, it is possible to correctly reproduce
the short and long time dynamics of standard fluid flows.

Primary authors: GABBANA, Alessandro; CORBETTA, Alessandro (Eindhoven University of Technology); GYRYA, Vitaliy (Los Alamos National Laboratory); LIVESCU , Daniel (Los Alamos National Laboratory); PRINS, Joost (Eindhoven University of Technology); TOSCHI, Federico (Eindhoven University of Technology)

Presenter: GABBANA, Alessandro

Session Classification: Session 3 B