

# Low Mach number flows and dimension reduction in fluid mechanics

Matteo Caggio

*Institute of Mathematics, CAS, Prague, Czech Republic*

We consider the compressible Navier–Stokes system describing the motion of a viscous fluid confined to a straight layer  $\Omega_\delta = (0, \delta) \times \mathbb{R}^2$ . We show that the weak solutions in the 3D domain converge strongly to the solution of the 2D incompressible Navier–Stokes equations (Euler equations) when the Mach number tends to zero as well as  $\delta \rightarrow 0$  (and the viscosity goes to zero). An extension to heat-conductive fluids in presence of strong stratification will be also discussed.

- [1] Caggio, Matteo; Donatelli, Donatella; Nečasová, Šárka; Sun, Yongzhong, Low Mach number limit on thin domains. *Nonlinearity* 33 (2020), no. 2, 840–863.