A possible disruption of filamentary streams in galactic halos

Nicolas Cornuault, Matthew Lehnert, François Boulanger, Pierre Guillard
Institut d'astrophysique de Paris
Groupe Origine et évolution des galaxies
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Simulations show filaments infalling toward galaxies

Characteristics
- WNM driven through the halo
- “Virial” shock propagating outwards
- Mass- and redshift-dependent
- Cooling and gravitational pull →
  - Homogeneous core
  - Laminar flow

Challenges
- Limited numerical resolution
  - Small scales (eg. Field’s) unresolved
  - Artificial viscosity caps maximal $Re$
- Not observed in known probed halos

Simulation from: T. Kimm, R. Cen, J. Devriendt, Y. Dubois, A. Slyz, 2015
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Competing timescales drive the fate of the flow

IGM  | halo  | to the galaxy

- laminar flow
- shock
- turbulent flow
- expansion

e.g. $M_H \sim 10^{13} M_\odot$, $z \sim 2$