Institut Henri Poincaré

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String Theory in Greater Paris

Rencontres Théoriciennes

"Supergravité, théorie des cordes et théorie M"

Jeudi 25 Mars 2021, 11:00

Blaise Goutéraux

Ecole Polytechnique

Hydrodynamic diffusion and its breakdown near AdS2 fixed points

Hydrodynamics provides a universal description of interacting quantum field theories at sufficiently long times and wavelengths, but breaks down at scales dependent on microscopic details of the theory. We use gauge-gravity duality to investigate the breakdown of diffusive hydrodynamics in two low temperature states dual to black holes with AdS_2 horizons. We find that the breakdown is characterized by a collision between the diffusive pole of the retarded Green's function with a pole associated to the AdS_2 region of the geometry, such that the local equilibration time is set by infra-red properties of the theory. The absolute values of the frequency and wavevector at the collision (ω_{eq} and k_{eq}) provide a natural characterization of all the low temperature diffusivities D of the states via $D = \omega_{eq}/k_{eq}^2$ where $\omega_{eq} = 2\pi\Delta T$ is set by the temperature T and the scaling dimension Δ of an infra-red operator. We confirm that these relations are also satisfied in an SYK chain model in the limit of strong interactions.

Institut Henri Poincaré, salle 314, 3ème étage

Retrouvez les activités de la communauté parisienne de théorie des cordes sur
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