The fluid road to holography

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Journée des thèses

November 15, 2018

What is holography?

- Mapping a d-dimensional thy to a D-dimensional one

- It is an instance of dualities $\Rightarrow$ pillars of modern thies they allow to unravel unified framework and construction

- Examples of dualities
  1. Electric magnetic duality $\Rightarrow$ Maxwell thy
  2. String dualities
  3. Gauge/Gravity duality
  4. many others...

Back to holography

- The data of a d-dim spacetime are recast in terms of its $d-1$-dim boundary: the world as an hologram

- Bulk: gravity thy $\leftrightarrow$ boundary: gauge thy (matter thy)

- Achtung developed for AdS bulk spacetime: can we extend it to flat bulk solutions?

- We worked in a particular setup:
  - gravity: AdS Einstein
  - boundary: hydrodynamical regime of matter thy

My contribution I

- Boundary hydrodynamics of Robinson-Trautman solution

  [Ciambelli, Petkou, Petropoulos, Siampos (17)]

- Perform the flat limit:
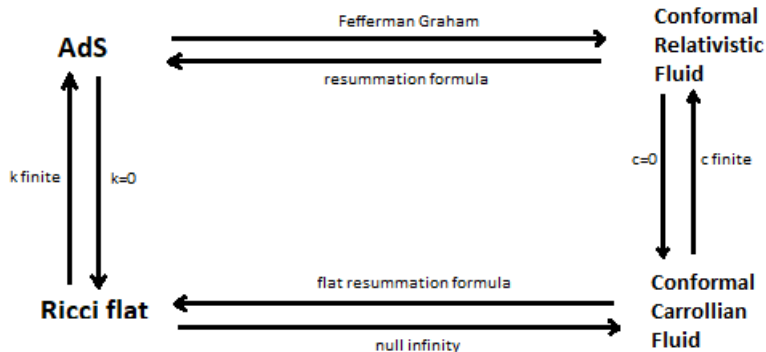
My contribution II

- The boundary hydro limit (c→0) is very peculiar

  [Ciambelli, Marteau, Petkou, Petropoulos, Siampos (18)]

- Eventually: flat GR/Carroll-hydro duality.

  [Ciambelli, Marteau, Petkou, Petropoulos, Siampos (18)]

- To better understand the null boundary, we studied its Carrollian stress tensors and charges.

  [Ciambelli, Marteau (18)]

Outlook:

- settle a microscopic flat correspondence
- better understand Carrollian hydrodynamics
- general null hypersurfaces geometry and physics