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The extended hydrodynamics and holography

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We report recent progress in extending relativistic hydrodynamics that is largely inspired by the gauge/gravity duality. First, we present a simple but nontrivial extension of Muller-Israel-Stewart (MIS) theory, namely MIS*, and demonstrate that it describes non-hydrodynamic response for both kinetic theory and strongly coupled super-Yang Mills theory. Second, we construct an effective field theory describing holography liquid with one conserved U(1) charge. In addition, such a theory includes K number of hidden local symmetries that are broken spontaneously. If K goes to the infinity limit, it reproduces the quasi-normal spectrum from holography.

Refs: Weiyao Ke, Yi Yin, JHEP 05 (2024) 171; Phys.Rev.Lett. 130 (2023) 21, 212303; Xin An, Micheal Heller, Robbe Brants , Yi Yin, in progress

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