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Ideal-spin hydrodynamics on top of a rotating background

After formulating the angular momentum conservation in a covariant form, we consider the equations of spin hydrodynamics in the background of an uncharged fluid in global equilibrium with a non-vanishing thermal vorticity.

Assuming that the spin degrees of freedom are not in equilibrium, we derive relaxation-type equations for the components of the spin potential.

These equations generalize the existing literature on the spin waves derived on top of a fluid in a hydrostatic state, where the thermal vorticity is zero.

We aim to understand the dynamics of relaxation of the spin potential to the thermal vorticity in a simple setup and also pave the way for realistic numerical simulations.

Category

Theory

Collaboration (if applicable)

Primary authors: CHIARINI, Annamaria; DASH, Ashutosh; RISCHKE, Dirk; SHOKRI, Masoud (Goethe University, ITP)

Presenter: CHIARINI, Annamaria

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