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The basic evolution of the angular momentum density in a field-theoretical model of vorticity transport FLORIN SPINEANU, MADALINA OLIMPIA VLAD, NILPRP, SADDRUDIN BENKADDA, Universite de Provence, Marseille, France — The structure of the vortical flow of two-dimensional plasmas and fluids evolves under the constraint imposed by the self-organization of the vorticity field, as shown by the extremum of an action functional obtained from the equivalent point-like vortices models. We formulate a field-theoretical model that provides the explicit form of the Lagrangian density and of the equations of motion for the vorticity. In this model the density of the angular momentum results from the field of vorticity and it is possible to infer nondissipative evolutions of the angular momentum from the trend of generating coherent states of the vorticity. The transport of angular momentum exhibits aspects similar to the so-called non-local transport in plasma and also to resilient radial profiles in stable stationary vortices. This can be a significant contribution to angular momentum transport in 2D plasmas, fluids, accreation discs, etc.

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