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ON THE CONVEXITY CONDITION FOR THE SEMI-GEOSTROPHIC SYSTEM

We argue that conservative distributional solutions to the Semi-Geostrophic system in a rigid domain are in some well-defined sense critical points of a time-shifted energy functional involving measure-preserving rearrangements of the absolute density and momentum, which arise as one-parameter flow maps of continuously differentiable, compactly supported divergence free vector fields. We also show that the convexity requirement on the modified pressure potentials arises naturally if these critical points are local minimizers of said energy functional for any admissible vector field.