Variational aspects of Liouville equations

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ABSTRACT: Liouville equations play a relevant role both in Differential Geometry and in Mathematical Physics. They appear in basic problems involving the prescription of the Gaussian curvature on surfaces, like the Uniformization Problem, as well in models from Fluid dynamics, Superconductivity and Electroweak Theory. We consider the existence problem using variational and topological arguments. We will examine in particular the role played by geometric inequalities and by the distributional characterization of volume-concentration.

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