

Variational features of Liouville equations

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Liouville equations are of elliptic type with exponential non-linearities. They play a prominent role in Differential Geometry (when prescribing the Gaussian curvature) as well as in Mathematical Physics (from the study of Chern-Simons vortices or of fluid dynamics). We will address mostly existence problems, attacked using a variational approach: we will combine in particular improved versions of the Moser-Trudinger inequality with topological methods.