Variational theory for Liouville equations in geometry and mathematical physics

Abstract: We consider a class of problems arising in conformal geometry (such as the Gaussian or Q-curvature prescription) or in mathematical physics (self-dualChern-Simons models, Electroweak theory). We derive existence results using variational theory and suitable improvements of the Moser-Trudinger inequality. In particular, we analyze the concentration behavior of the conformal volume on metrics for which the Euler-Lagrange functional loses coercivity."