On a heat equation with exponential nonlinearity in $\mathbb{R}^2$

Bernhard Ruf

Università degli Studi di Milano
ruf@mat.unimi.it

We consider a semilinear heat equation with exponential nonlinearity in $\mathbb{R}^2$. We prove that local solutions do not exist for certain data in the Orlicz space $\exp L^2(\mathbb{R}^2)$, even though a small data global existence result holds in the same space $\exp L^2(\mathbb{R}^2)$. Moreover, some suitable subclass of $\exp L^2(\mathbb{R}^2)$ for local existence and uniqueness is proposed.