Non-uniqueness for a family of nonlinear heat equations in two dimensions

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Abstract. In this talk we deal with a class of nonlinear heat equations in two dimensions. Recently, for some specific nonlinearities with exponential growth of Trudinger-Moser type, Ioku et al [1] and Ibrahim et al [2] exhibit a singular stationary solution. Then, they prove that the Cauchy problem, with this singular solution as initial data, admits, at least, two different solutions. Here we consider similar problems for a wider class of nonlinearities in two dimensions.

Joint work with Yohei Fujishima (Shizuoka University, Japan), Norisuke Ioku (Tohoku University, Japan) and Bernhard Ruf (Istituto Lombardo, Italy).

References

[1] Ioku, N., Ruf, B., Terraneo, E., *Non-uniqueness for a critical heat equation in two dimensions with singular data*, Ann. Inst. H. Poincaré, **36**, (2019), 2027–2051.

[2] Ibrahim, S., Kikuchi, H., Nakanishi, K., Wei, J., *Non-uniqueness for an energy-critical heat equation on* $\mathbb{R}^2$, Math. Ann. **380**, (2021), no. 1-2, 317-348.