

Sharp regularity for singular and degenerate pdes

José Miguel Urbano¹,

¹ University of Coimbra, Centre for Mathematics (CMUC)

We provide a broad overview of qualitative versus quantitative regularity estimates in the theory of singular and degenerate parabolic pdes. The former relates to the method of intrinsic scaling, while the latter is achieved by means of geometric tangential analysis. We discuss, in particular, sharp estimates for the Stefan problem, the parabolic p -Poisson equation, the porous medium equation and Trudinger's equation.

References

- [1] D.J. ARAÚJO, A. MAIA AND J.M. URBANO, *Sharp regularity for the inhomogeneous porous medium equation*, J. Anal. Math. 140 (2020), 395–407.
- [2] D.J. ARAÚJO, E.V. TEIXEIRA AND J.M. URBANO, *A proof of the C^p -regularity conjecture in the plane*, Adv. Math. 316 (2017), 541–553.
- [3] P. BARONI, T. KUUSI AND J.M. URBANO, *A quantitative modulus of continuity for the two-phase Stefan problem*, Arch. Ration. Mech. Anal. 214 (2014), 545–573.
- [4] N. M. L. DIEHL AND J.M. URBANO, *Sharp Hölder regularity for the inhomogeneous Trudinger's equation*, Nonlinearity 33 (2020), 7054–7066.
- [5] E.V. TEIXEIRA AND J.M. URBANO, *A geometric tangential approach to sharp regularity for degenerate evolution equations*, Anal. PDE 7 (2014), 733–744.
- [6] J.M. URBANO, *The Method of Intrinsic Scaling*, Lecture Notes in Mathematics 1930, Springer-Verlag, Berlin, 2008.