

Free Boundary Problems in PDEs and Related Issues

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Título: Free boundary problems with varying singularities.

Resumo: We consider free boundary models arising from minimizing energy functionals with varying singularities. If the singular exponent is measurable and bounded above and below away from zero, we establish the optimal local $C^{1,\alpha}$ -regularity of minimizers. Sharp regularity estimates along the free boundary are also obtained under a mild continuity assumption on the exponent. Such estimates vary point-by-point, leading to multiple free boundary geometries. This is joint ongoing work with Damião Araújo (Universidade Federal da Paraíba, Brazil) and Eduardo Teixeira (University of Central Florida, USA).