

New developments in the lower dimensional obstacle problem

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Resumo

We will describe the Signorini, or lower-dimensional obstacle problem, for a uniformly elliptic, divergence form operator $L = \operatorname{div}(A(x)\nabla)$ with Lipschitz continuous coefficients. We will give an overview of what is known about this problem, new developments and the role of a new monotonicity formula for an appropriate generalization of Almgren's frequency functional in the optimal regularity of the solution. Similarly to what happens when $L = \Delta$, one of our main results states that the variational solution has the optimal interior regularity $C_{loc}^{1, \frac{1}{2}}(\Omega_{\pm} \cup \mathcal{M})$, when \mathcal{M} is a codimension one flat manifold which supports the obstacle and divides the domain Ω into two parts, Ω_+ and Ω_- . This is joint work with Nicola Garofalo.