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Title: Sign changing solutions of Poisson's equation

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Abstract Let Ω be an open, possibly unbounded, set in Euclidean space $\mathbb{R}^m$ with boundary $\partial\Omega$, let A be a measurable subset of Ω with measure $|A|$, and let $\gamma \in (0,1)$. We investigate whether the solution $v_{\Omega,A,\gamma}$ of $-\Delta v = \gamma \mathbf{1}_{\Omega - A} - (1-\gamma)\mathbf{1}_A$ with $v = 0$ on $\partial\Omega$ changes sign. Bounds are obtained for $|A|$ in terms of geometric characteristics of Ω (bottom of the spectrum of the Dirichlet Laplacian, torsion, measure, or R-smoothness of the boundary) such that $v_{\Omega,A,\gamma}$ is either non-negative or is sign changing. Joint work with Dorin Bucur, Université de Savoie.