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A minimization problem for the principal eigenvalue of the Laplacian with large drift

Let $\Omega \subset \mathbb{R}^d$ be a C^2 bounded domain and $L = \Delta + v \cdot \nabla$ on Ω under Dirichlet boundary condition, where v is a bounded vector field on Ω. We consider the minimal principal eigenvalue λ_1 and the related principal eigenfunction φ in the class of drifts having a given, but large, pointwise upper bound, and prove asymptotic properties of λ_1 and φ. This is joint work with François Hamel and Luca Rossi.