EXISTENCE OF MINIMIZERS OF CHEEGER'S FUNCTIONAL AMONG CONVEX SETS

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The celebrated Cheeger’s inequality provides a lower bound to the ratio between the first Dirichlet eigenvalue of the p-Laplacian and the Cheeger constant of any given set. A natural question is whether this bound is sharp and whether there exist sets minimizing this ratio among some suitable class of subsets of R^N. In the talk, I will consider these questions for the class of convex subsets of R^N and I will show that the bound is never sharp for any N and p, while there exist minimizers for any N and p, positively settling conjectures by Parini (2017) and Briani—Buttazzo—Prinari (2022).