ISOPERIMETRIC INEQUALITY FOR THE TWO-DIMENSIONAL MAGNETIC ROBIN LAPLACIAN

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In this talk, we consider the two-dimensional magnetic Robin Laplacian with a negative boundary parameter on a bounded and sufficiently smooth domain. The respective magnetic field is chosen to be homogeneous. Among a certain class of domains, we prove that the disk maximizes the ground state energy under the fixed perimeter constraint provided that the magnetic field is of moderate strength. This class of domains includes, in particular, all domains that are contained upon translations in the disk of the same perimeter and all centrally symmetric domains. Our result generalizes the isoperimetric inequality for the Robin Laplacian without magnetic field due to Antunes, Freitas, and Krejčiřík.

This talk is based on a joint work with Ayman Kachmar.