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Helical magnetic fields and semi-classical asymptotics of the lowest eigenvalue

We study the 3D Neuman magnetic Laplacian in the presence of a semi-classical parameter and a non-uniform magnetic field with constant intensity. We determine a sharp two term asymptotics for the lowest eigenvalue, where the second term involves a quantity related to the magnetic field and the geometry of the domain. In the special case of the unit ball and a helical magnetic eld, the concentration takes place on two symmetric points of the unit sphere.

Joint work with B. Helffer (Nantes).