The magnetic Laplacian in shrinking tubular neighbourhoods of hypersurfaces

Matěj Tušek
Faculty of Nuclear Sciences and Physical Engineering,
Czech Technical University in Prague, Czech Republic
tusekmat@fjfi.cvut.cz

The Dirichlet Laplacian between two parallel hypersurfaces in Euclidean spaces of any dimension in the presence of a magnetic field is considered in the limit when the distance between the hypersurfaces tends to zero. We prove that the Laplacian converges in a norm-resolvent sense to a Schrödinger operator on the limiting hypersurface whose electromagnetic potential is expressed in terms of principal curvatures and the projection of the ambient vector potential to the hypersurface. If time permits, we show some possible applications of this result.