

Relating Dirichlet/Neumann fields in bounded and unbounded Lipschitz domains

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(joint work with Dirk Pauly)

Given a basis of Dirichlet/Neumann fields with mixed boundary conditions in a bounded Lipschitz domain we present a general procedure to obtain a linear independent set of compactly supported fields in the corresponding exterior domain. These fields serve as linear functionals for various Helmholtz type decompositions (projections on gradients/rotations). Moreover, their canonical projections define a basis for the Dirichlet/Neumann fields of the exterior Lipschitz domain.

The other direction from the exterior domain to the bounded domain is discussed as well.

These results are crucial for the investigation of the low frequency limit for time-harmonic Maxwell equations in an exterior domain, which have to be treated in polynomially weighted Sobolev spaces.

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