

Sharp regularity results for solutions of boundary value problems

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We study the well-posedness of initial boundary value problems for the linear Schrödinger equations on a half space. The boundary data lie in a (allegedly optimal) Bourgain type Sobolev space, which allows to include Neuman and transparent boundary conditions in the analysis. Strichartz estimates (in L^2) are obtained thanks to an explicit solution formula. In the case of Dirichlet boundary data, the regularity of solutions is obtained provided natural compatibility conditions are satisfied. The regularity results concern fractional regularity, and include the more delicate case where the initial data are in $H^{1/2}$. The proof of regularity uses an interpolation argument that can be applied to other boundary value problems.

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