

Elliptic equations with transmission and Wentzell boundary conditions and an application to steady water waves in the presence of wind

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Abstract

We present results about the existence and uniqueness of solutions of elliptic equations with transmission and Wentzell boundary conditions. We provide Schauder estimates in Hölder and Sobolev spaces. As an application, we develop an existence theory for small-amplitude two-dimensional traveling waves in an air-water system with surface tension. The water region is assumed to be irrotational and of finite depth, and we permit a general distribution of vorticity in the atmosphere.