SCATTERING BY NON-COMPACT OBSTACLES AND SURFACE WAVES

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ABSTRACT. One discusses the scattering theory for the Laplace operator $H = -\Delta$ in an unbounded domain Ω (for example, in the half-space) of the Euclidean space $\mathbb{R}^d$ obtained by removing from $\mathbb{R}^d$ of some non-compact part. Some self-adjoint boundary conditions on $\partial\Omega$ are added. Under very general assumptions we show that the absolutely continuous spectrum of the operator H covers the positive half-line. The proof relies on a time-dependent construction which is similar to the construction of wave operators in potential scattering. A difficult problem is the completeness of such wave operators. In general, their completeness can be violated which is intimately connected with the existence of surface waves propagating along the boundary $\partial\Omega$.