

Eigenvalue asymptotics for strong δ -interactions supported on curves with corners

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Let $\Gamma \subset \mathbb{R}^2$ be a piecewise smooth closed curve with corners. We discuss the asymptotic behavior of the individual eigenvalues of the two-dimensional Schrödinger operator $-\Delta - \alpha\delta_\Gamma$ for $\alpha \rightarrow \infty$, where δ_Γ is the Dirac δ -distribution supported by Γ . It is shown that the asymptotics of several first eigenvalues is determined by the corner openings only, while the main term in the asymptotic expansion for the other eigenvalues is the same as for smooth curves. Under an additional assumption on the corners of Γ (which is satisfied, in particular, if Γ has no acute corners), a more detailed eigenvalue asymptotics is established in terms of a one-dimensional effective operator on the boundary.