

In this thesis we study simple one-dimensional two-channel scattering model where pointlike coupling between channels is provided by the delta potential. The scattering task can be completely solved analytically. The solution of the Lippmann-Schwinger equation leads to improper scattering eigenvectors, consequently to scattering S matrix elements and eigenphases. We study how the setting of parameters affects threshold and resonant behaviour (presence, position, width) and the mutual relationship between resonances and poles of the S matrix in complex k -plane. Then we apply projection-operator formalism to model with resonance and the on-shell T matrix is separated into the orthogonal, direct and resonant term. We discuss how choice of subspace of quasi-bound states effects the separation.