

Non-perturbative behavior of QCD appears as hadrons and their interactions. The mass, decay width and transition form factor of a nucleon resonance provide us basic and fundamental information to understand low energy QCD. Resonance parameters are extracted from amplitudes of πN scattering, meson-photoproduction and electroproduction. The purpose of this work is to extract resonance parameters such as mass, width and electromagnetic transition form factors from the $\pi N - \pi N$ and $\gamma^* N - \pi N$ amplitudes by analytic continuation. Meson-production reactions are dominated by final states of πN , ηN and $\pi\pi N$ in the energy region above 1.3 GeV. We have developed the dynamical reaction model which includes πN , ηN and also unstable particle channels σN , ρN and $\pi\Delta$ coupled with $\pi\pi N$, but no analytic continuation method has been applied to such a dynamical model with unstable particle channels. In this work we develop an method of analytic continuation for the amplitude including those unstable channel. We apply the method for the scattering amplitude from the dynamical reaction model and extract mass, width and the electromagnetic $N - N^*$ transition form factors.