

APCTP SEMINAR

Resonance and decay of the $N^*(1875)$ in triangle singularity

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Online via **ZOOM**

In this talk, we will first briefly review the mechanism of the triangle singularity in hadronic scattering processes. Then, the resonance of the $N^*(1875)(3/2^-)$ with a coupled-channel unitary approach is studied by considering the Δ^{\oplus} and Σ^*K , with their interaction extracted from chiral Lagrangians. In addition, two more channels, the $N^*(1535)^{\oplus}$ and $N\sigma$ are taken into account via triangle diagrams involving the Σ^*K and Δ^{\oplus} respectively in the intermediate states. As results, the triangle diagram in the $N^*(1535)^{\oplus}$ case develops a singularity at the same energy as the resonance mass. We determined the couplings of the resonance to the different channels and the partial decay widths. We found a very large decay width to Σ^*K and observed that, due to interference with other terms, the $N\sigma$ channel has an important role in the Δ^{\oplus} mass distributions at low invariant masses, leading to an apparently large $N\sigma$ decay width. Finally, we discuss justifying the convenience of an experimental reanalysis of this resonance using coupled-channel unitary schemes.

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