



Contribution ID: 60

Type: not specified

Sequential single pion production explaining the dibaryon "d*(2380)" peak

Tuesday, 14 September 2021 16:30 (20 minutes)

We study the two step sequential one pion production mechanism, $np(I=0) \rightarrow \pi pp$, followed by the fusion reaction $pp \rightarrow \pi + d$, in order to describe the $np \rightarrow \pi + \pi - d$ reaction with $\pi + \pi -$ in $I=0$, where a narrow peak, so far identified with a "d(2380)" dibaryon, has been observed. We find that the second step $pp \rightarrow \pi + d$ is driven by a triangle singularity that determines the position of the peak of the reaction and the large strength of the cross section. The combined cross section of these two mechanisms produce a narrow peak with the position, width and strength compatible with the experimental observation within the approximations done. This novel interpretation of the peak without invoking a dibaryon explains why the peak is not observed in other reactions where it has been searched for.

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Session Classification: Oral Presentations