



Contribution ID: 22

Type: **not specified**

Influence of the laser field on electron muon neutrino process

Monday, 21 March 2022 15:25 (15 minutes)

In view of the great contribution of neutrino-electron scattering to the deep understanding of electroweak interactions, we focus in this paper on the study of elastic scattering of a muon neutrino by an electron ($e - \nu_{\mu} \rightarrow e - \nu_{\mu}$) in the presence of a circularly polarized electromagnetic field. We perform our theoretical calculation within the framework of Fermi theory using the exact wave functions of charged particles in an electromagnetic field. The expression of the differential cross section (DCS) for this process is obtained analytically in the absence and presence of the laser field. The effect of the field strength and frequency on the exchange of photons as well as on the DCS is presented and analyzed.

keywords: Laser-assisted , Cross Section, Electroweak Interaction

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Session Classification: Parallel Session II