

CP violation in coherent elastic neutrino-nucleus scattering experiments

Friday 17 May 2019 09:25 (25 minutes)

The presence of new neutrino-quark interactions can enhance, deplete or distort the coherent elastic neutrino-nucleus scattering (CEvNS) event rate. The new interactions can involve CP violating phases that can potentially affect these features. Assuming vector light mediators we study the effects of CP violation on the CEvNS process, and for that aim we consider the COHERENT sodium-iodine (NaI), liquid argon (LAr) and germanium detectors. We identify a region in parameter space for which the event rate always involves a dip and another one for which this is never the case. We show that the presence of a dip in the event rate can be used to constraint CP violating effects, in such a way that the larger the detector volume the tighter the constraints. In the region where no dip is present, we find that CP violating parameters can mimic the SM CEvNS prediction or spectra induced by real parameters. Thus, we point out that the interpretation of CEvNS data in terms of new physics should take into account possible CP violating effects.

Preferred Session

Neutrinos

Comments

Author: ARISTIZABAL, Diego (Universidad Tecnica Federico Santa Maria (USM))

Presenter: ARISTIZABAL, Diego (Universidad Tecnica Federico Santa Maria (USM))

Session Classification: Neutrinos