

# Phenomenology 2020 Symposium



Contribution ID: 1022

Type: **Parallel Talk**

## A new mechanism for Matter Anti-Matter asymmetry

Monday 4 May 2020 15:00 (15 minutes)

We propose a new mechanism for generating matter-antimatter asymmetry via the interference of tree-level diagrams only. We first derive a general result that a nonzero  $CP$ -asymmetry can be generated via at least two sets of interfering tree-level diagrams involving either  $2 \rightarrow 2$  or  $1 \rightarrow \text{cal}N$  (with  $\text{cal}N \geq 3$ ) processes. We illustrate this point in a simple TeV-scale extension of the Standard Model with an inert Higgs doublet and right-handed neutrinos, along with an electroweak triplet scalar field. The imaginary part needed for the required  $CP$ -asymmetry comes from the trilinear coupling of the inert doublet with the triplet scalar. Small Majorana neutrino masses are generated by both the scotogenic and type-II seesaw mechanisms. The real part of the neutral component of the inert doublet serves as a cold dark matter candidate. The evolutions of the dark matter relic density and the baryon asymmetry are intimately related in this scenario.

### Summary

Matter Anti-Matter Asymmetry

**Primary author:** DASGUPTA, Arnab (School of Liberal Arts, Seoul National University of Science and Technology)

**Co-authors:** KANG, Sin Kyu (Seoul-Tech); Dr DEV, Bhupal (Washington University in St. Louis); Dr ZHANG, Yongchao

**Presenter:** DASGUPTA, Arnab (School of Liberal Arts, Seoul National University of Science and Technology)

**Session Classification:** BSM I

**Track Classification:** BSM