



Contribution ID: 368

Type: **not specified**

A new approach to t-channel singularities in cosmology

Monday, 23 August 2021 16:20 (20 minutes)

A t -channel singularity of a cross section occurs in a $2 \rightarrow 2$ process when the mediator is allowed to be on-shell, i.e. when the process can be treated as a sequence of a $1 \rightarrow 2$ decay and a $2 \rightarrow 1$ inverse decay. If, moreover, the mediator is stable, this singularity cannot be regularized within the common Breit-Wigner approach.

In this talk I will discuss the conditions for the singularity to occur and briefly summarize attempts (proposed in literature) to regularize it in case of collider physics and cosmological considerations of a thermal medium of particles. After showing that none of previously proposed ways to solve the problem is satisfactory in the cosmological case, I will present a natural solution developed within the Keldysh-Schwinger formalism: a non-zero imaginary part of the mediator's self-energy that appears as a consequence of interactions between the mediator and the thermal medium. Consequently, the mediator acquires a non-zero effective decay width and the cross section becomes finite.

Primary author: IGLICKI, Michał (University of Warsaw)

Presenter: IGLICKI, Michał (University of Warsaw)

Session Classification: Early Universe Cosmology

Track Classification: Early Universe Cosmology