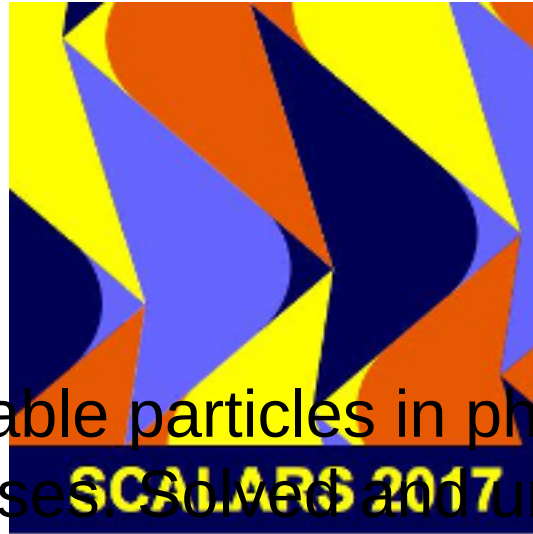


Scalars 2017



Contribution ID : 30

Unstable particles in physical processes. Solved and unsolved problems

Saturday 02 Dec 2017 at 16:45 (00h15')

Content :

We consider three different series of problems

1. The t -channel singularity in small angle scattering (almost solved).

In the processes like $\mu^+ \mu^- \rightarrow W e \nu$ with effective mass $e \nu$ lower than m_μ transferred momentum of ν can be both space-like and time-like. In the naive approach it gives divergent cross section. This difficulty is eliminated when treat initial states as wave packets, no plane wave. We discuss experiment in which such phenomenon can result sizable effect.

2. The s -channel singularity near threshold (a way for solution is seen). If the decay $A \rightarrow BC$ is possible, cross section of process $\gamma A \rightarrow BC$ grows at lower energy of photon ω as $1/\omega^2$. The solution of this problem is in the fact that the number of photons per volume at finite field energy decreases as $1/\omega^3$. We discuss possible using of approach to the description of processes in strong non-monochromatic field.

3. The perturbative QFT with unstable particles for the observable processes (unsolved). The space of states in the loop calculation on EW theory contains heavy W , Z , etc.. They should be removed from the loop, since these particles have no asymptotic states. How to formulate accurate theory?

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