

## Chern-Simons portal

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The Standard Model (SM) is the best theory of particle physics for today, giving precise predictions. However, it fails to explain some fundamental problems such as the strong CP problem, neutrino oscillations, matter-antimatter asymmetry, and the nature of dark matter and dark energy.

To resolve these problems it seems reasonable to add new particles to the SM. Since these particles are not detected they can be either very heavy (with a mass more than energy scale of the available accelerators) or light but very weakly interacting with the SM particles. The particles of the last type, also called feebly interacting massive particles (FIMPs), can be searched in intensity frontier experiments like SHiP.

One can classify FIMPs by their type: scalar, pseudoscalar, fermion, vector or pseudovector particles and interaction with SM. The most promising to search are such interactions that connect FIMP to the SM in a renormalizable way or using low-order operators. If these particles are light their parameters and interaction with the SM particles can be determined by physics at a very large scale.

In this talk, we considered the Chern-Simons extension of the SM by the new light pseudovector particle because this extension of the SM was relatively recently proposed and it is not sufficiently studied.

We have analytically calculated the process of heavy quark decay into light quark and pseudovector boson that allows us to calculate the process of heavy meson decay with Chern-Simons particle production. These results will be used to find the sensitivity of the SHiP experiment to detect Chern-Simons particles.

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