Contribution ID: 36

Status of sub-GeV Hidden Particle Searches

Hidden sectors are frequently proposed as part of the physics beyond the standard model. Since their interactions with the visible sectors are very weak, so are the current experimental bounds. In fact, those sectors might even contain particles with masses in the sub-GeV range that have so far escaped detection. Among those weakly interacting slim particles (WISPs) are hidden U(1) gauge bosons, the CP-odd Higgs of the NMSSM, and other axion-like particles.

From a top-down perspective, such particles arise from string compactifications that reproduce the NMSSM and/or contain (multiple) hidden U(1)s. Additionally, they are of great interest in many models that seek to interpret recent terrestrial and astrophysical anomalies (e.g. e+e- excesses observed by PAMELA, annual modulation signal reported by DAMA/LIBRA) in terms of dark matter.

We present constraints from various meson decays, g - 2 as well as beam dump and reactor experiments on those hidden sector particles with masses below the muon threshold. The NMSSM CP-odd Higgs and generally any pseudoscalar is required to be heavier than 210 MeV or have couplings to fermions that are four orders of magnitude below those of the SM Higgs. Hidden photons of the same mass range are also severely constrained yet not excluded and can be searched for at future beam dump experiments.

Primary author: ANDREAS, Sarah (Deutsches Elektronen-Synchrotron DESY, Notketrasse 85, D-22607 Hamburg, Germany)

Presenter: ANDREAS, Sarah (Deutsches Elektronen-Synchrotron DESY, Notketrasse 85, D-22607 Hamburg, Germany)