Contribution ID: **15** Type: **not specified**

New axion and hidden photon constraints from a solar data global fit

Wednesday 24 June 2015 16:20 (20 minutes)

I will present the results of a our last paper that presents a new statistical analysis that combines helioseismology sound speed,surface helium and convective radius) and solar neutrino observations (boron and beryllium fluxes) to place upper limits to the properties of non standard weakly interacting particles. Our analysis includes theoretical and observational errors, accounts for tensions between input parameters of solar models and can be easily extended to include other observational constraints. We present two applications to test the method: the well studied case of axions and axion-like particles and the more novel case of low mass hidden photons. For axions we obtain an upper limit at 3σ for the axion-photon coupling constant of gaγ<4·10−10 GeV−1. For hidden photons we obtain the most restrictive upper limit for the product of the kinetic mixing and mass of χm < 1.82·10−12 eV at 3σ. Both cases improve the previous solar
constraints based on the Standard Solar Models showing the power of our global statistical approach.

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