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Cosmological bounds on active-sterile neutrino mixing after Planck data

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In recent years a renewed attention has been devoted to low-mass sterile neutrinos, after intriguing but controversial hints coming from precision cosmological measurements and laboratory oscillation experiments. Light sterile neutrinos can be produced by oscillations with active neutrinos in the early universe. Their properties can be constrained by their contribution as extra-radiation, parameterized in terms of the effective number of neutrino species N_{eff} , and to the universe energy density today Omega_nu h^2. A recent breakthrough in constraining the N_{eff} and the neutrino masses is represented by the first data release of the Planck experiment. Motivated by this new data, we update the cosmological bounds on (3+1) sterile neutrino scenarios performing an extensive scan of the sterile neutrino mass and mixing parameter space.

Primary author: Dr SAVIANO, Ninetta (DESY)

Presenter: Dr SAVIANO, Ninetta (DESY)

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