



Contribution ID: 10

Type: **not specified**

Anisotropic 2-form dark energy

Thursday 30 May 2019 10:00 (30 minutes)

We study the dynamics of dark energy in the presence of a 2-form field coupled to a canonical scalar field ϕ . We consider the coupling proportional to $e^{-\mu\phi/M_{\text{Pl}}} H_{\alpha\beta\gamma} H^{\alpha\beta\gamma}$ and the scalar potential $V(\phi) \propto e^{-\lambda\phi/M_{\text{Pl}}}$, where $H_{\alpha\beta\gamma}$ is the 2-form field strength, μ, λ are constants, and M_{Pl} is the reduced Planck mass. We show the existence of an anisotropic matter-dominated scaling solution followed by a stable accelerated fixed point with a non-vanishing shear. Even if $\lambda \geq \text{calO}(1)$, it is possible to realize the dark energy equation of state w_{DE} close to -1 at low redshifts for $\mu \gg \lambda$. The existence of anisotropic hair and the oscillating behavior of w_{DE} are key features for distinguishing our scenario from other dark energy models like quintessence.

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Session Classification: Cosmology