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Experimental constraints on models with light scalar field in cosmology and particles physics (SNLS/eBoss experiments and CMS experiment at the LHC).

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The current standard models, both in particle physics and cosmology, have been largely validated experimentaly with an unprecedented precision to this day. Yet, these models are not able to answer several important questions of modern physics. Two of them concern the nature of Dark Energy and Dark Matter, that have been highlighted from astrophysical and cosmological observations.
Several models have been proposed to address these issues, and this thesis aims at putting some experimental constraints on models with additional light scalar fields for both particle physics experiments and cosmological observations.
In particle physics, I am studying the branon model that provides an answer to the nature of Dark Matter, by comparing the results of a search for monojet and single hadronically decaying vector boson productions in the CMS data from Run 2 of LHC with the predictions of known processes.
In cosmology, the goal is to put constraints on the galileon model, which aims at describing the late acceleration of the expansion of the Universe. To achieve this goal, I am using all the available cosmological observables measurements, namely : SNIa, BAO, growth rate of structures and the full angular power spectrum of temperature of the CMB. The focus will be on the latter, which constraints have yet to be derived.

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