

SEMINARIO
Departamentos de Física Teórica I y II
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TITULO: Disentangling dark matter nature from intersecting D6-branes with Stückelberg portal

LUGAR: FACULTAD DE CIENCIAS FÍSICAS UCM

DÍA: 10 de junio, 2015 (Miércoles)

HORA: 14:30

AULA: Seminario Depto. Física Teórica I, Planta 3ª

ABSTRACT:

In this work we study the phenomenological aspects of Stückelberg portals where the mediator between the Standard Model and the dark matter (DM) is a massive Z' boson. Those scenarios are well motivated by certain string theory constructions and naturally lead to isospin violating interactions of DM particles with nuclei. In particular we focus on the type IIA string theory models where the SM is build up with intersecting D6-branes and we present the way of obtaining this Z' portal connecting the SM and the DM sectors within this context. We show that in these constructions the ratios between the DM coupling to neutrons and protons for both, spin-independent (f_n/f_p) and spin-dependent (a_n/a_p) interactions are generically different from ± 1 (i.e. different couplings to protons and neutrons) leading to a potentially measurable distinction from other popular portals. We present the current constraints coming from both direct and indirect detection experiments and also the LHC. Finally we perform a scan over all the parameters including all the existing bounds to determine the experimentally allowed values of f_n/f_p and a_n/a_p , obtaining phenomenological consequences for direct and indirect detection signals.