



Dynamical Dark Matter: An Explicit Model

Saturday, 7 July 2012 09:45 (15 minutes)

In this talk, we provide an explicit realization of the DDM framework in which the constituent fields of the dark-matter ensemble are the mixed KK excitations of an axion propagating in the bulk of large extra spacetime dimensions. Mixing between these KK excitations, induced by a brane mass term, leads to a suppression of the interactions between the light mass eigenstates in the KK tower and the Standard-Model fields on the brane. Largely as a result of this suppression, the DDM ensemble in this model satisfies all collider, astrophysical, and cosmological constraints while at the same time providing the observed dark-matter relic abundance. This model therefore serves as an existence proof that the DDM framework is a viable alternative to traditional models of dark matter.

Financial Support Justification for Early-Stage Researchers

I am a postdoctoral fellow at the University of Hawaii. My travel budget is very limited, and because of the geographical location of my institution, travel costs are particularly high for me no matter where the location happens to be. For this reason, I am typically required to dip into my own personal savings in order to pay travel expenses. My travel to and participation at ICHEP will therefore be funded entirely out of my own pocket. In order to make such travel feasible for me and not financially burdensome, I am hoping that the ICHEP organizers could provide support to cover the registrations cost for the conference, as well as some of the travel expenses (airfare is approximately \$1600.00 USD round-trip from Honolulu). However, regardless of the amount of support available, I would greatly appreciate any financial help you can provide, and am hoping that such support will make it feasible for me to participate in what I am expecting to be an engaging and productive conference.

Summary

In this talk, we provide an explicit realization of the DDM framework in which the constituent fields of the dark-matter ensemble are the mixed KK excitations of an axion propagating in the bulk of large extra spacetime dimensions. Mixing between these KK excitations, induced by a brane mass term, leads to a suppression of the interactions between the light mass eigenstates in the KK tower and the Standard-Model fields on the brane. Largely as a result of this suppression, the DDM ensemble in this model satisfies all collider, astrophysical, and cosmological constraints while at the same time providing the observed dark-matter relic abundance. This model therefore serves as an existence proof that the DDM framework is a viable alternative to traditional models of dark matter.

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