

# Dark Forces in the Sky: signals from $Z'$ and the dark Higgs

*Monday, 25 July 2016 16:30 (15 minutes)*

**Based on (arXiv number)**

## Summary

We consider the indirect detection signals for a self-consistent hidden  $U(1)$  sector, containing a fermionic dark matter candidate, dark gauge boson and a Dark Higgs. The presence of an additional scalar, the Dark Higgs, provides a mass generation mechanism for the dark sector particles and is required to avoid unitarity violation at high energies. We find that the inclusion of the additional scalar to the sector opens up a new two-body channel and allows fermionic dark matter annihilation to be used to probe the properties of a scalar final state. We examine the phenomenology of the sector with a focus on this new process, and determine the limits on the model parameter space from Fermi data on Dwarf Spheroidal Galaxies and other relevant experiments.

**Primary author:** Dr CAI, Yi (The University of Melbourne)

**Co-authors:** Dr BELL, Nicole F. (The University of Melbourne); Ms LEANE, Rebecca K. (The University of Melbourne)

**Presenter:** Dr CAI, Yi (The University of Melbourne)

**Session Classification:** Direct Dark Matter Detection

**Track Classification:** Indirect Dark Matter Detection