



Contribution ID: 1073

Type: Oral Presentation

## Dark sector shining through 750 GeV dark Higgs boson at the LHC (12' + 3')

*Friday, 5 August 2016 09:55 (15 minutes)*

We consider a dark sector with  $SU(3)_C \times U(1)_Y \times U(1)_X$  and three families of dark fermions that are chiral under dark  $U(1)_X$  gauge symmetry, whereas scalar dark matter  $X$  is the SM singlet.  $U(1)_X$  dark symmetry is spontaneously broken by nonzero VEV of dark Higgs field  $\langle \Phi \rangle$ , generating the masses of dark fermions and dark photon  $Z'$ . The resulting dark Higgs boson  $\phi$  can be produced at the LHC by dark quark loop (involving 3 generation) and will decay into a pair of photon through charged dark fermion loop. Its decay width can be easily  $\sim 45$  GeV due to its possible decays into a pair of dark photon, which is not strongly constrained by the current LHC searches  $pp \rightarrow \phi \rightarrow Z'Z'$  followed by  $Z'$  decays into the SM fermion pairs. The scalar DM can achieve thermal relic density without conflict with direct detection bound or the invisible  $\phi$  decay into a pair of DM.

**Primary author:** KO, pyungwon (Korea Inst. for Advanced Study (KIAS))**Co-author:** NOMURA, Takaaki (N)**Presenter:** KO, pyungwon (Korea Inst. for Advanced Study (KIAS))**Session Classification:** Joint Beyond the Standard Model & Higgs**Track Classification:** Beyond the Standard Model