



Galactic Dark Matter in the Phantom Dark Energy Background

Saturday, July 7, 2012 6:00 PM (1 hour)

We study the possibility that the galactic dark matter exists in the phantom field responsible for the dark energy. The statically and spherically exact solution for this kind of the galaxy system with a supermassive black hole at its center is obtained. The solution of the metric functions is satisfied with $g_{tt} = -g_{rr}^{-1}$. In a galaxy, the background of the phantom field, which is spatially inhomogeneous, has an exponential potential. The absorption cross section of the low-energy S -wave excitations, arising from the phantom dark energy background, into the central black hole is shown to be the horizontal area of the central black hole. The accretion of the phantom energy is accompanied with the decrease of the black hole mass, which is estimated to be much less than a solar mass in the lifetime of the Universe. Using a simple model with the cold dark matters very weakly coupled to the excited phantom particles, we show that these two densities can be stable in the galaxy.

M.H. Li and K.C. Yang, "Galactic Dark Matter in the Phantom Field", ArXiv:1204.3178 [astro-ph.CO].

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