

## R10a Sensitivity Study of Decaying Dark Matter Search with Segue 1 Dwarf Galaxy

Yu Zhou (KEK), Volodymyr Takhistov (KEK), Kazuhisa Mitsuda (NAOJ)

Dark matter (DM) decay is generically predicted in many particle DM scenarios. X-ray band is favorable for warm DM search, including sterile neutrino and axion-like-particle (ALP) DM. Especially, spurious 3.5 keV line excess observed in a stacked or individual sample of galaxy clusters and its DM or atomic origin have been disputed with large uncertainty. Therefore, obtaining independent measurement with less photon background for various celestial object is valuable. Dwarf galaxy Segue 1, given its known extremely high DM-to-light ratio, constitutes an ideal target for detecting DM or obtaining an upper limit. We perform sensitivity studies of decaying DM search with Segue 1 using XRISM and hypothetical detector with 2 eV energy resolution. For 100 ks observation with gate valve closed, XRISM can achieve sensitivity in DM couplings improving by over an order of magnitude compared to the best previous limits from Segue 1 observations by Swift. We also demonstrate that the DM or atomic origin of the spurious 3.5 keV line can be well distinguished if observed by a detector with better than 4 eV energy resolution.