

Constraints on heavy dark matter from LHAASO gamma ray observations

LHAASO KM2A and WCDA are two detectors used to detect gamma rays for different energy range: greater than 10 TeV for KM2A and less than 10 TeV for WCDA. These detectors can be utilized for searching for dark matter. Decaying dark matter and annihilating dark matter can potentially result in a gamma ray excess compared to the background. In our study, we first performed data analysis to distinguish gamma rays from cosmic ray signals and then combined the Monte Carlo (MC) results to determine the gamma ray flux. We carefully selected five regions of interest to subtract the background, based on valid reasons. Our analysis of KM2A results revealed no excess of decaying dark matter signals. Consequently, we established constraints on the lifetime of heavy dark matter particles with masses ranging from 10^4 to 10^9 GeV. Moving forward, our future work aims to investigate the WCDA component and explore the search for annihilation dark matter.

Primary authors: Mr LEUNG, Dylan; Ms ZHANG, Weizhen

Co-authors: Ms WANG, Luyao; Dr YOU, Xiaohao

Presenters: Mr LEUNG, Dylan; Ms ZHANG, Weizhen