Summary

Heavy Dark Matter searches with LHAASO

Heavy dark matter is motivated by several extensions of the Standard Model, including gauge-mediated SUSY models, hidden strong gauge sectors, Homeopathic DM and so on. In most of these models, Heavy Dark Matter is metastable and It can decay into standard model particles, producing primary and secondary high energy gamma rays.

W show how LHAASO can be the best probe for tests of Heavy Dark Matter decays from diffuse very high energy gamma rays measurements.

LHAASO will have the highest sensitivity in world for diffuse very high energy gamma rays from 100 TeV towards the PeV scale.

Our simulations of Heavy DM decays into quarks comparing different position in the sky, gamma rays absorption and galactic magnetic fields show that LHAASO can constraint a large region of DM parametric space.

On the other hand, very high energy neutrinos observed by IceCube may be the first evidence of Heavy DM decay. If so, we would expect a combined measure of very high energy gamma rays from DM decays with LHAASO.

Thus LHAASO can have a high impact not only on our understanding of astrophysics and PeV-atrons but also in fundamental physics beyond the standard model of particles and interactions.