

AKjDPG 1: jDPG Tutorium – Dark Matter

Time: Monday 13:00–13:50

Location: ZHG007

Invited Talk AKjDPG 1.1 Mon 13:00 ZHG007
Introduction to direct dark matter searches — ●DANIEL WENZ
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A large number of evidence from galactic to cosmic scales suggests the existence of a massive, non-luminous, and non-baryonic matter component which is five times more abundant than regular matter. This so-called dark matter (DM) represents an excellent window to the physics Beyond the Standard Model of particles. One well-motivated class of DM candidates are so called weakly interacting massive particles (WIMPs).

To directly search for WIMPs, highly sensitive experiments are re-

quired which utilize different techniques to discriminate environmental backgrounds from potential signals. Not only in the direct search for WIMPs, but also in other rare event searches like searches for the neutrinoless double beta decay, or solar neutrinos, similar techniques are used to measure these faint and rare signals.

In this tutorial we will discuss the fundamentals of the direct search of WIMP dark matter and use this as an example to illustrate how these challenging experiments in the field of rare event searches are designed. As an example, we will have a closer look at the XENONnT experiment which is one of the world leading experiments in the direct search of high mass WIMPs.