

OCTOBER 2018



EXPERIMENTS

DARK MATTER: THE PADME EXPERIMENT STARTED THE DATA TAKING PHASE

On October 4th, the experiment PADME (Positron Annihilation into Dark Matter Experiment) for the search of dark matter entered the data acquisition phase thus concluding the commissioning period.

PADME will study the interactions produced by positrons accelerated to the energy of 550 MeV from the linear accelerator (LINAC), of the INFN National Laboratories of Frascati. Its goal is to find an hypothetical particle called the "dark photon". The experiment is based on a hypothesis advanced by some theoretical models that foresee the existence of a fifth force able to connect the dark matter with our world and that would be added to the four known fundamental forces: gravitational, electromagnetic, strong nuclear and weak nuclear. To this new fifth force, as it happens for the other four, a messenger particle would be associated, in this case a "heavy" photon, having a small mass (as opposed to the ordinary photon which does not possess it). Physicists named it "dark photon". PADME is an international collaboration involving researchers from the MTA Atomki institute in Debrecen, of Hungary, the University of Sofia, of Bulgaria, the Cornell University, the Iowa University and the William and Mary College of the United States.