

Seminarium Studium Doktoranckiego NCBJ

Poniedziałek, 13 maja, godzina 9:00

ul. Pasteura 7, sala 404

Speaker: Oleg Shkola

Studium Doktoranckie NCBJ

Title: Search for heavy charged particles at CMS

Abstract: Many extensions of the Standard Model (SM) predict the existence of heavy, long-lived charged particles (HSCPs). These particles might have speed significantly less than speed of light and/or charge, not equal to $\pm 1e$. With lifetimes greater than a few nanoseconds, HSCPs can travel distances larger than the typical collider detector and appear stable like pions or kaons. Because particle identification algorithms at hadron collider experiments generally assume signatures characteristic of Standard Model (SM) particles, e.g., speed close to the speed of light and a charge of $\pm 1e$, HSCPs may go unidentified. A further complication arises from the fact that HSCPs might be charged during only a part of their passage through detectors, further limiting the ability of standard algorithms to identify them. It is however possible to detect HSCPs making use of their higher rate of energy loss via ionization (dE/dx) and longer time of flight to the outer detectors, in comparison with SM particles. During the seminar, results of dedicated searches, done at Compact Muon Solenoid (CMS) experiment on data collected during 2016 will be discussed along with the improvements to the muon timing calculations done by the CMS Warsaw group.