

## Feasibility study for a Muon Forward Tracker in ALICE

ALICE is the experiment dedicated to the study of the quark gluon plasma in heavy-ion collisions at the LHC. Improvement of ALICE sub-detectors for the upgrade plans of the year 2017 are ongoing. The Muon Forward Tracker (MFT) is a proposal in view of this upgrade. The MFT is a Silicon pixels detector added in the Muon spectrometer acceptance ( $-4 < \eta < -2.5$ ) upstream of the hadronic absorber. The MFT upgrade is motivated by several physics improvements. The measurement of the DCA (Distance of Closest Approach) of single muons and secondary vertex from dimuons will permit the identification of open charm ( $c\tau \sim 150$  microns) and beauty ( $b\tau \sim 500$  microns) mesons. The MFT, thanks to its tracking capabilities, will allow to improve the mass resolution of the resonances for a better separation between  $\rho/\omega$  and  $\phi$ ,  $J/\psi$  and  $\psi'$ , and  $\Upsilon$  family resonances. In addition, it will help to reject a large fraction of muons coming from pion and kaon decays, improving the signal over background ratio. Moreover, the MFT will lead to the direct multiplicity measurement, event by event, of charged particles within the spectrometer acceptance. In order to evaluate the feasibility of this upgrade, five Silicon planes were simulated within the AliRoot framework. Effects of multiple scattering in the absorber and L3 magnetic field on muons in the MFT will be shown. A detailed study of the influence of the beam pipe geometry on secondary particles production was performed. Performances of the MFT in terms of occupancy rates in the pixel plans, secondary vertex measurement, improvement of the dimuon invariant mass resolution were established. The method used for tracking in the planes and matching between the muon tracks and MFT tracks will also be presented.

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