Subject: Re: Pions decays in detector
Posted by Anna Skachkova on Fri, 18 Oct 2019 10:17:45 GMT

According to PDG, the mean life time of charged pion is tau = 2.6 x 10^-8 sec, that means, the mean lenght of pion decay is c x tau = 7.8 m.
Simulation in PYTHIA shows (see muon TDR p.19 or arXiv:hep-ph/0506139v2 p.23) that the most part of decay muons are produced close to the interaction point,
while the rest are distributed over detector volume (with a mean value for the whole space close to 7.8 m). And there are about 3 muons from meson decays per 10 background events at this energy produced in detector volume, according to branching ratio of meson decays. So such a small number of final muons after PandaRoot looks pretty strange. While the initial number of pions in PYTHIA and DPM backgrounds are rather compatible, the final number of muons in fast simulation in PYTHIA and after simulation in PandaRoot are drastically differ. Is it possible to pull out the model of pion decays, contained in PandaRoot (Geant) to understand such a difference?