
Subject: Re: PANDA ToF Task Force Questions
Posted by [Vladimir Vikhrov](#) on Wed, 08 Jul 2009 11:49:33 GMT
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Dear colleague,

concerning the implication of barrel TOF on PANDA EMC i would propose to make a plot - radiation length of all sub-detectors (MVD, STT/TPC, barrel TOF, barrel DIRC) until EMC versus polar angle. The similar plot was already done for beam & target pipes and MVD (look for example Rene Jakel report on collab. meeting 11.12.2007). Barrel TOF could be included in 3 options:

- 1) RPC (X/X_0 ~6% as declared, but overlapping and realistic material budget should be taken into account)
- 2) Scintillator TOF with constant thickness in Z (let it be 4 cm)
- 3) so called "tapered" scintillator, with ~constant X/X_0 versus Z

During the last collab. meeting Bertram Kopf presented the result of his MC simulation for the second option. He didn't found strong theta dependence in losses of efficiency of π^0 reconstruction and S/B ratio (pp. 10&11 of his report). This is what i would like to understand. For the particles coming from the interaction point (it is true for the gammas from π^0 decay) radiation length depends on polar angle - if at $\theta=90^\circ$ barrel TOF has a $X/X_0=10\%$ then at 30° it will be 20% (two times!) and at 20° will be 29%. But we see 2% drop in efficiency loss at 20° only. If somebody understand this?

I think we need to continue our MC simulation to understand how barrel TOF material can affect on EMC versus polar angle.

Best regards from St.Petersburg,
Vladimir