RUHR-UNIVERSITÄT BOCHUM

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Summary of old DIRC Preshower studies (Bertram Kopf, EMC TDR)

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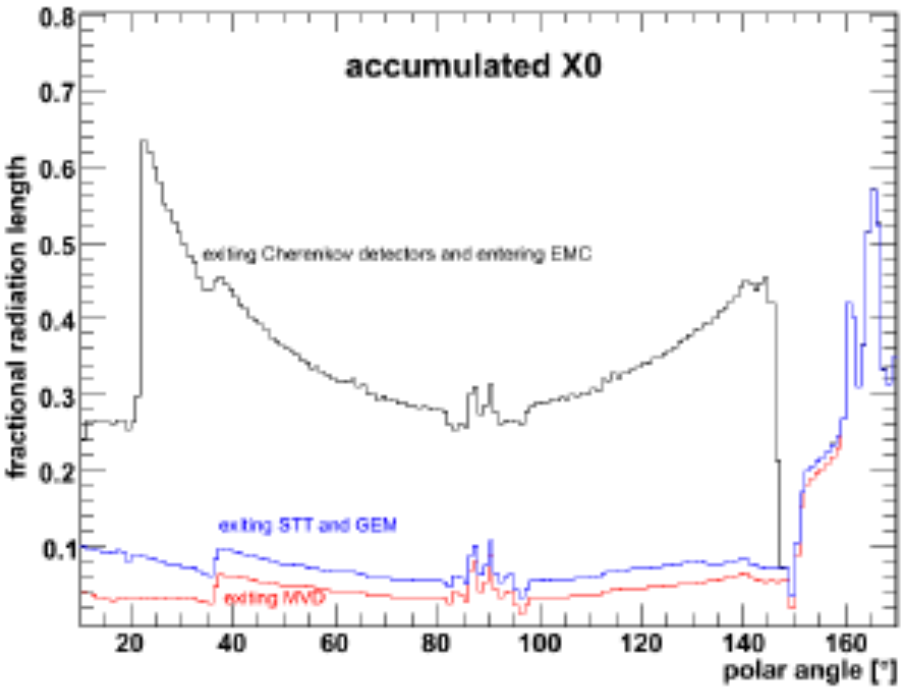
Experimentelle Hadronenphysik

Material in front of the EMC (status 2008)
From the EMC TDR chapter 9.2



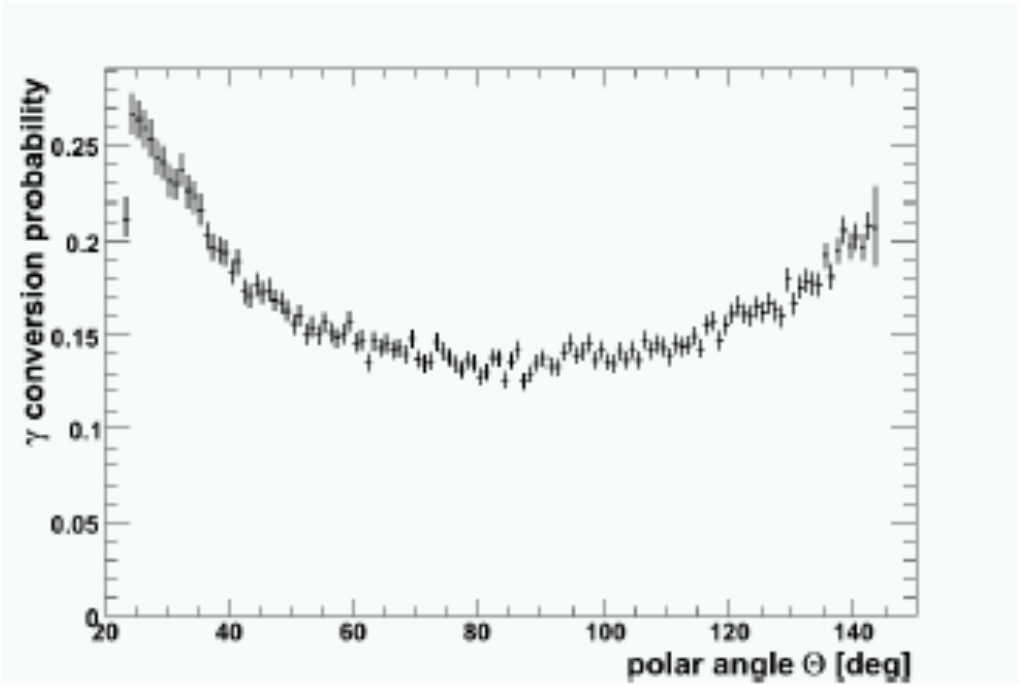


Figure 9.13: γ conversion probability in the DIRC as a function of Θ.

Current situation may slightly differ, due to different DIRC support structure.
But in addition possibly SciTil.

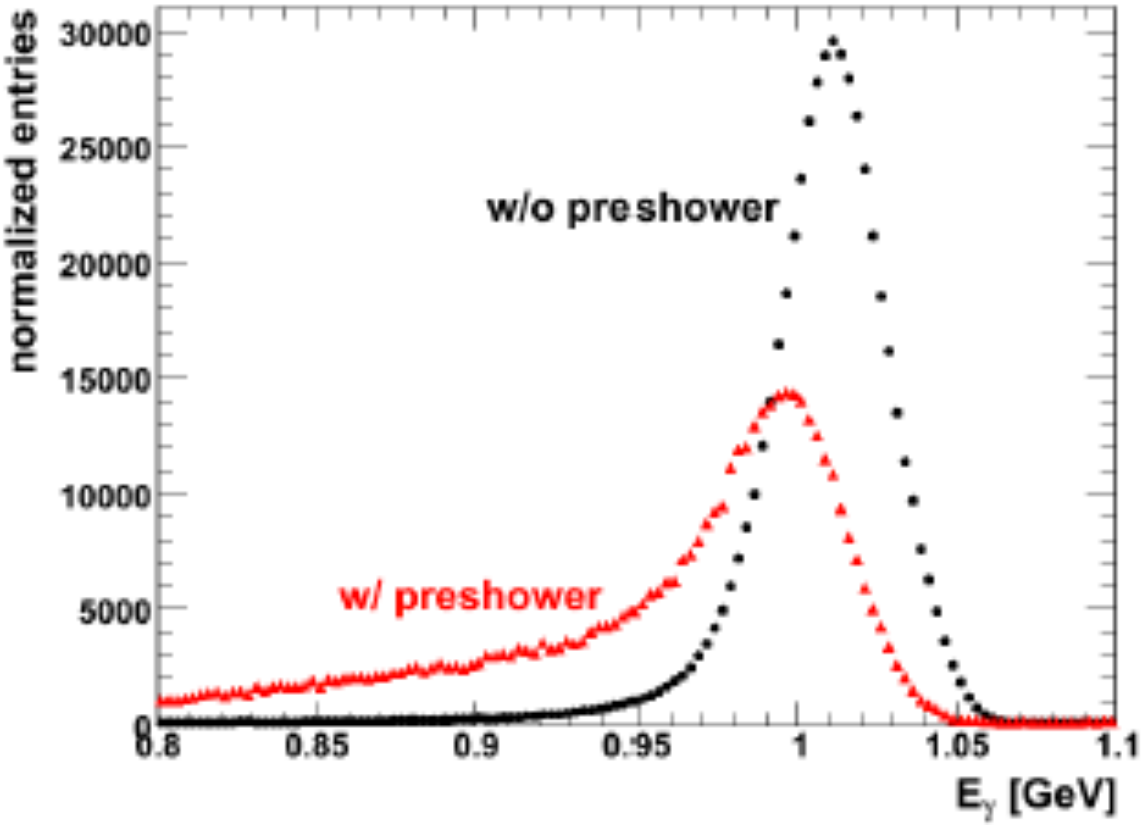


Figure 9.14: Reconstructed energy of 1 GeV photons without (black circles) and with (red triangles) DIRC preshowers. For a better comparison the plot with DIRC preshowers is scaled by a factor of 4.87.

9.2.1.1 Outlook: Preshower Recognition and Energy Correction.

If the Cherenkov light originating from the produced $e^+ e^-$ pairs gets measured, the number of detected Cherenkov photons provides a measure for the energy loss, and thus an energy correction of such clusters could be feasible. A DIRC preshower recognition with an additional energy correction would yield in a better performance of the photon reconstruction.

Based upon recent investigations for the BaBar experiment, it is expected to achieve a DIRC preshower detection efficiency of better than 50% and an improvement for the photon energy resolution of more than 1% [8].

https://www.physi.uni-heidelberg.de//Publications/adametz05.pdf