
Subject: Abnormal distribution

Posted by [Jifeng Hu](#) on Mon, 21 Jan 2013 17:45:17 GMT

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In this simulation, a box generator was used to shoot three 1GeV energy photons. Then their energy was reconstructed (E_{rec}), and compared to the energy in Monto Carlo truth (E_{truth}).

please see the plot in the attachment.

The X-axis shows the polar angle in unit rad, the Y axis shows the energy difference ($E_{\text{rec}}-E_{\text{truth}}$) in unit GeV.

We can find,

- a) the Shashlyk calorimeter has a worse resolution, but a longer right-side tail, it implies a incorrect reconstruction in EMC cluster or bump.
- b) for the intersection between forward calorimeter and shashlyk calorimeter, still a longer right-side tail exists.
- c) barrel calorimeter looks good, a left-side tail arises from the energy leak in crystal and energy loss before hitting crystals.
- d) for the intersection between barrel and backward, there exists a large gap, but abnormal reconstruction near theta value 2.5.
- e) energy reconstruction near the edge of backward calorimeter need more correction.

What are your opinions?

The energy reconstruction determines the photon detection efficiency.

File Attachments

- 1) [energy_vs_theta.eps](#), downloaded 556 times
