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Subject: Re: Cherenkov photons generation (FairBoxGenerator) updated!

Posted by [Jochen Schwiening](#) on Tue, 24 Aug 2010 14:02:41 GMT

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Hi Stefano,

what Maria and I want to do is shoot photons towards the DIRC photodetector plane and have Geant perform the propagation and optics - focusing, deflection and reflection at optical interfaces - and the registration of hits on the detector pixels.

We want to scan a range of polar and azimuth angles for the "primary" photons so that we hit all possible pixels that can be viewed from one bar.

Then, we want to produce histograms of the production photon angles for each detector pixel so that we know which angles reach which pixels for a given bar.

All this is in the context of testing a fast reconstruction approach for the DIRC, inspired by what we did at BaBar.

When I run `sim_dirc.C` from the `macro/drc` directory I get the usual response from the DIRC in event display. If I use, for instance, pions or muons as primary particle I get hits and "rings". This works from the 0,0,0 IP or from a displaced position inside a DIRC bar, for example at 50.5,11.6,-110. If I switch to primary particle photon (22) at the IP or displaced, I see the photon interact, sometimes create secondaries, which in turn will create Cherenkov photons, and then hits, if I select the option in `g3Config`. If I lower the energy of the photon I still see some reaction but somewhere below 1 MeV/c momentum the photon becomes invisible in event display (absorbed or G3-killed, not sure). And in no case do I get a hit registered by the DIRC photon detector, instead the photon penetrates the detector plane and continues on if it makes it that far.

As soon as I chose a primary Cherenkov photon (50000050) for the gun, ROOT crashes as Maria explained. Doesn't matter which momentum or location I pick for the photon gun.

Any ideas on how to shoot photons from inside a DIRC bar at the detector plane and register hits would be welcome.

Thanks, Jochen

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