Subject: Re: back-propagation with GEANE
Posted by Anastasia Karavdina on Wed, 23 Jun 2010 09:31:52 GMT
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Hi Lia!
Finally I understood source of our problem!
It's rounding accuracy!
For example without magnetic field I don't need to rotate the luminosity monitor and middle of the first plane always in 1100 cm. The thickness of plane 150 mkm, so position of first surface of first plane should be always in 1099.9925 cm. But we use TVector3 for store hit information (and I think it use double to store each coordinate), so z coordinate is not exactly 1099.9925 it is 1099.992554. Then GEANE takes this number and it's rounded to 1099.9926. And for GEANE it means that this point placed inside silicon plane (after 1 mkm of silicon), so GEANE calculate energy loss and so on. Without magnetic field z coordinate of first hit always the same (1099.992554) and I always have energy loss, because GEANE round it to 1099.9926. With magnetic field I have to rotate my planes, so z coordinate of hit on the first plane depends from x coordinate. For GEANE number 1099.99254 and 1099.99255 are not the same, because it is rounded in 1099.9925(outside Lumi) and 1099.9926(inside Lumi) respectively. What's why in half of events I have energy loss and in half of events I haven't. It doesn't depend from particle direction and other things it's only statistics.

This is log file:

StartPos:
TVector3 A 3D physics vector (x,y,z) = (3.455978,-5.988487,1099.992554)
StartMom:
TVector3 A 3D physics vector (x,y,z) =(0.027962,-0.048452,8.899824)
 =====> starting GEANE tracking for ANTIPROTON NEPRED = 1 with options : BLE
     X   Y   Z   R   NAME NUMBER SLENG   STEP   DESTEP   GEKIN
MECHANISMS
    3.4560 -5.9885 1099.9926   6.9142 LumA   0   0.0000   0.0000   0.0 eV   8.011 GeV
 NULL
    3.4560 -5.9885 1099.9871   6.9141 LumA   0   0.0056   0.0056 19.5 keV   8.011
GeV NEXT NEXT LOSS
    3.4560 -5.9885 1099.9871   6.9141 cave   1   0.0056   0.0000   0.0 eV   8.011 GeV
NULL
    2.3716 -4.1094 754.8403   4.7447 cave   1   345.1591 345.1536   0.0 eV   8.011
GeV FIEL
    1.2872 -2.2304 409.6935   2.5752 cave   1   690.3127 345.1536   0.0 eV   8.011
GeV FIEL
    0.2028 -0.3514   64.5467   0.4057 cave   1 1035.4663 345.1536   0.0 eV   8.011
GeV FIEL
   -0.8816   1.5276 -280.6001   1.7638 cave   1 1380.6199 345.1536   0.0 eV   8.011
GeV FIEL
   -1.9660   3.4066 -625.7469   3.9332 cave   1 1725.7734 345.1536   0.0 eV   8.011
GeV FIEL
   -3.0504   5.2857 -970.8937   6.1027 cave   1 2070.9270 345.1536   0.0 eV   8.011
GeV FIEL
   -3.4560   5.9885-1099.9927   6.9142 cave   1 2200.0286 129.1016   0.0 eV   8.011
GeV FIEL PRED

Is it possible to improve accuracy of input for GEANE? (and using for instance 1099.992554

instead of 1099.9926)

Cheers,
Anastasia.