
Subject: Good News

Posted by [Anonymous Poster](#) on Thu, 09 Apr 2009 12:45:05 GMT

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Hi everybody,

well this turned out to be a longer message. Not very smart to send that around before Easter. But please read it completely since it contains a lot of useful information (at least I believe so). But maybe you can just read it after Easter

As you might remember, I reported a lot of good news on Tuesday but also some bad ones, namely a problem with floating point exceptions. I identified what the problem is:

In line 138 of the file fairsoft/transport/geant3/erpremc/trsdsc.F a FPE happened in the assignment statement:

RC(J)=S(J)

We found out why that happens: The right hand side is double precisions floating points and the left hand side is single precision. It crashed when the RHS values were above $\sim 10^{30}$ to 10^{40} . This is expected behavior.

We figured out that that happens if the momentum vector is parallel to the z-axis. Then we found out that also this is expected behavior: In the fortran code of geane it says in several comments that this case is not supported. In the TPC this lead to crashes because sometimes there can be delta-rays emitted in such a way (parallel to z-axis).

We solved this by throwing an exception in GeaneTrackRep in these cases ($\text{mom.Theta()} < 0.4$ deg for the moment) and now the fitting becomes extremely stable!! We do not get any more crashes and we really pushed my program very hard!

We also solved another problem about the determination whether something is a forward or backward extrapolation in GeaneTrackRep which lead to some instability. The determination of extrapolation direction in GeaneTrackRep is now fully solved and stable!

Just one thing we want to say which is not positive: Since PANDA is a fixed target experiment, we have a lot of forward going events! We will have to figure out a way how to fit these events stably. Of course this will have to be figured out by the experts on forward tracking, but we can at least state the only obvious idea that comes to mind: Maybe we could somehow rotate our coordinate system for forward tracks, but we expect that to become at least a little complicated, because of the material maps which are of course in unrotated coordinates.

But to positively summarize the situation: Besides an open question for very small angles between momentum vectors and the z-axis the tracking in PANDARoot is now very stable and performs well! The last small problem are the missed detector planes, but they just slightly decrease the number of hits we use in the track fits. They do not keep us in any way from doing physics with PANDARoot and genfit.

Happy Easter!

Christian, Felix & Sebastian
