
Subject: Re: Problem with low momentum Pion
Posted by [Andrea Fontana](#) on Fri, 04 Apr 2008 07:51:32 GMT
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Hello Vanni,

this problem is generated in one of the internal routines of GEANE called TRPROP. I include the comment of this routine:

```
      SUBROUTINE TRPROP(X1,P1,H1,X2,P2,H2,CH,XL,R,MVAR,IFLAG,ITRAN,IERR)
C
C *** ERROR PROPAGATION ALONG A PARTICLE TRAJECTORY IN A MAGNETIC FIELD
C ROUTINE ASSUMES THAT IN THE INTERVAL (X1,X2) THE QUANTITIES 1/P
C AND (HX,HY,HZ) ARE RATHER CONSTANT. DELTA(PHI) MUST NOT BE TOO LARGE
C
C Authors: A. Haas and W. Wittek
C
C *** IFLAG = -1  INITIALIZATION, TRANSFORMATION OF ERROR MATRIX FROM
C      EXTERNAL TO SC VARIABLES
C      = 0  ERROR PROPAGATION FROM X1 TO X2
C      = 1  TRANSFORMATION OF ERROR MATRIX FROM SC TO
C      EXTERNAL VARIABLES
C
C ITRAN      USED FOR IFLAG = 0 OR 1 ONLY
C      = 0  TRANSFORMATION MATRIX IS UPDATED ,BUT ERROR MATRIX IS NOT
C      TRANSFORMED
C      = 1  TRANSF. MATRIX IS UPDATED  AND ERROR MATRIX IS TRANSFORMED
C
C MVAR      SPECIFIES TYPE OF EXTERNAL VARIABLES
C      = 0  ( 1/P,LAMBDA,PHI,YT, ZT ; SC )
C      = 1  ( 1/P, Y', Z', Y, Z ; SPLINE )
C
C *** X1, P1, H1  X,Y,Z COMPONENTS OF POSITION, MOMENTUM AND MAGNETIC
INPUT
C      FIELD VECTOR/GRADIENT AT STARTING POINT OF INTERVAL
C X2, P2, H2  ..... AT END POINT OF INTERVAL          INPUT
C CH          CHARGE OF PARTICLE                      INPUT
C XL          PATHLENGTH FROM X1 TO X2 ( NEGATIVE IF OPPOSITE
C            TO ACTUAL MOVEMENT OF PARTICLE )          INPUT
C R          ERROR MATRIX (TRIANGLE)                  INPUT/OUTPUT
C B          5 * 5 TRANSFORMATION MATRIX FOR ERRORS IN
C            SC VARIABLES                              OUTPUT
C
C *** IERR = 1  ILLEGAL VALUE OF MVAR                OUTPUT
C            2  MOMENTUM IS ZERO
C            3  H*ALFA/P AT X1 AND X2 DIFFER TOO MUCH
C            OR DELTA PHI IS TOO LARGE
C            4  PARTICLE MOVES IN Z - DIRECTION
C
```

This routine as an exit flag called IERR that can have 4 states: in this case the error TRPROP 3 means that the IERR = 3. In my experience this condition

is due to a stepping problem when you have a too high curvature in the track. My first suggestion is to try to reduce the steps size: I was usually able to overcome this error by reducing the steps. This means that you have to rerun the MC, since the stepping definition is in the medium parameters. As we discussed with Mohammad this is the only option now. So you can try to define an AUTONULL medium with small steps and put AUTO=0 in the g3Config.C file and do the tracking in this way. Some tests and tuning is required, I think, to find the optimal conditions.

Second idea which we are thinking about is to extract this IERR flag from the inner fortran routines and to bring it to the C++ interface, so that we can deal properly with these situations. We are thinking about this just now.

I hope this helps you for the moment. Let me know if you succeed with the manual stepping.

Ciao,
Andrea
