

LArSoft - Bug #17048

floating point divide by zero in tca:MCSMom

06/27/2017 06:05 PM - Thomas Junk

Status:	Resolved	Start date:	06/27/2017
Priority:	Normal	Due date:	
Assignee:	Bruce Baller	% Done:	50%
Category:	Reconstruction	Estimated time:	0.00 hour
Target version:		Spent time:	0.30 hour
Occurs In:		Co-Assignees:	
Experiment:	-		

Description

This is spotted in larsoft v06_33_00, but it looks like the code may still be unprotected.

in

larreco/RecoAlg/TCAAlg/Utils.cxx

MCSMom can divide by zero if MCSThetaRMS returns zero. MCSThetaRMS can return 0 if this line

```
if(numPts > 5 && cnt < 0.7 * numPts) return tj.MCSMom;
```

satisfies the conditions in the if and tj.MCSMom is zero. The divide that fails is this:

```
double mom = 13.8 * sqrt(tjLen / 14) / MCSThetaRMS(tjs, tj, firstPt, lastPt);
```

and tjLen is close to zero (1E-315) as well. So it's not a big deal, but if we turn on FP Exceptions, then 0/0 will cause the program to fault.

Related issues:

Blocks LArSoft - Necessary Maintenance #17047: Floating Point Exceptions

Assigned

06/27/2017

History

#1 - 06/28/2017 09:13 AM - Gianluca Petrillo

- Related to Necessary Maintenance #17047: Floating Point Exceptions added

#2 - 06/28/2017 09:56 AM - Bruce Baller

- % Done changed from 0 to 100

Changed return value from 0 to 1 in MCSThetaRMS if a 0 length trajectory is found.

#3 - 06/28/2017 06:05 PM - Lynn Garren

- Status changed from New to Resolved

This fix is in the newly built larsoft v06_42_00 release.

#4 - 06/29/2017 01:35 PM - Gianluca Petrillo

- Related to deleted (Necessary Maintenance #17047: Floating Point Exceptions)

#5 - 06/29/2017 01:35 PM - Gianluca Petrillo

- Blocked by Necessary Maintenance #17047: Floating Point Exceptions added

#6 - 06/29/2017 01:36 PM - Gianluca Petrillo

- Blocked by deleted (Necessary Maintenance #17047: Floating Point Exceptions)

#7 - 06/29/2017 01:36 PM - Gianluca Petrillo

- *Blocks Necessary Maintenance #17047: Floating Point Exceptions added*

#8 - 06/30/2017 05:25 PM - Thomas Junk

- *Status changed from Resolved to Assigned*

I'll change this back to assigned. I reran a dune reconstruction job in v06_42_00 and got the same FP exception. Putting a tracepoint on line 2036 of larreco/RecoAlg/TCAlg/Utils.cxx shows that just before the FP exception, numPts = 10, cnt = 1, and tj.MCSMom = 0, and the return statement returns zero. Thanks for fixing the other return 0 at the end of that method -- that's probably the source of similar FP divide by zeros.

#9 - 01/09/2018 02:48 PM - Katherine Lato

- *Category set to Reconstruction*

- *Assignee set to Bruce Baller*

- *% Done changed from 100 to 50*

Bruce,
Can you see if you can find and fix this?
Katherine

#10 - 07/12/2018 11:07 AM - Bruce Baller

- *Status changed from Assigned to Resolved*