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Subject: Re: SPU problem explanation.

Posted by [Anonymous Poster](#) on Wed, 07 Oct 2009 11:07:54 GMT

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Hi Lia,

the solution to this unfortunate inconsistency is to treat spu as a real track parameter. In this way it is only predicted and/or updated consistently with the other parameters describing the track. So here is how I did it:

- 1) I make the state vector 6 dimensional (parameter in GeaneTrackRep.h and some hardcoded 5->6 in the cxx file) so that spu becomes track parameter number 5 (start counting from 0)
- 2) Very important: Initialize the 5th row and 5th column of the now 6x6 covariance matrix with 0
- 3) Due to this initialization, the update step in the Kalman will never change the value of spu which comes out of the prediction (The Kalman gain is 6x2 (for a 2D hit) where the last row is just zero, if the covariance has only 0 in the 5th row and column to begin with. If you take my PandaNote and insert the matrices into the equations this becomes clear very easily.
- 4) Every time you use spu, extract it from the state vector
- 5) Delete the parameter as a member of GeaneTrackRep

I have done all this in GeaneTrackRep2 which is the class that I use for the external GENFIT. In principle this class should also work inside PandaROOT (together with TGeoManager and FairMCApplication). I will also make it available in the next weeks, and then you can just take a look for yourself. If you want to look now, get genfit at <https://genfit.svn.sourceforge.net/svnroot/genfit> and look in the GeaneTrackRep directory.

If you have any further questions, please do not hesitate to ask me.

Cheers, Christian

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