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Subject: Re: Coordinate system for hit parameters  
Posted by [Volker Frieze](#) on Fri, 02 Mar 2012 19:57:25 GMT  
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Many years ago, in the stone ages of cbmroot, we decided to store the parameters of hits, tracks etc. in the global coordinate system. The reasons were:

Global coordinates allow a straightforward interpretation. Local coordinates always need the context of the detector geometry.

It is supposedly easier for tracking, which connects hits from different detectors / stations / modules, to work with global coordinates.

I think these reasons still hold nowadays. Of course, for the creation of hits from digis, the local coordinate system is the relevant one. That means that after the creation of the hits in a particular piece of detector, their coordinates (and the covariance matrix) have to be transformed into the global coordinate system. The computational costs for this are most probably much less than the repeated transformations needed otherwise during track finding and fitting.

Note that the above holds strictly only for the persistent data objects (i.e. those put into the TClonesArray of the cbmsim TTree). Both the hit finders and the tracking algorithms can transiently use whatever data format they consider appropriate.

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