

SVD software overview

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Simulation

Tasks	Taken care by	Comments
SVD geometry	Jozef Koval (Prague), Jan Scheirich (Prague)	Geant4 transition completed, latest changes implemented? → report in this session
SVD digitizers and clustering	Peter Kvasnicka (Prague)	Local version of full digitizers available, not yet committed → report in this session
SVD occupancy calculation	Peter Kvasnicka (Prague)	Will use full digitizers

Offline reconstruction

Task	Taken care by	Comments
Offline PXD/SVD pattern recognition	Jakob Lettenbichler (Vienna)	→ report in the Wednesday morning plenary
PXD/SVD track fitting	Moritz Nadler (Vienna)	→ report in this session

Other tasks

Task	Taken care by	Comments
PXD/SVD alignment	Claus Kleinwort (DESY)	Just started
Data format	Tohoku group	Just started → report in this session

Questions by software coordinators

Q: *realistic digitization*

Though the simple digitization is fine with the tracking code development, the realistic digitization is also important for an estimation for the beam background effect (occupancy) on physics. And sooner or later, it should be prepared for reconstruction finally. Please provide us when it will be available.

A: The major part of the digitization/clustering is ready (in Prague) and will be used for the background study

Further development: Proper simulation of time information, validation and tuning of the digitizer code (requires testbeam readout with basf2)

Questions by software coordinators (2)

Q: *data format*

It is a bit hard to decide the raw data format now, but you can start designing the data format after digitization such as "DatSVD_Hit", "DatECL_EHits" in Belle SVD or ECL. These data format might be related to the geometry, calibration, alignment, reconstruction, MC true information, etc. It means, you also have to consider the correlation between these data. I believe that most of you have experience to use Belle data and it is not so difficult to design this data format for Belle II because the contents are similar to those in Belle. Please provide us when it will be available.

A: Probably a minor task as much can be taken from Belle (BN #422). As more processing is done in hardware, it should be clarified what is still needed. There is some connection to the database development. Also, as many things are under development, we should keep some flexibility here.

Questions by software coordinators (3)

Q: *beam background overlay in simulation*

In Belle II, beam background overlay (similar to "addbg" in Belle) will be done before digitization (addbg was done after digitization in Belle). This issue has been already discussed in the past B2GM. For the moment, this is not the priority but I would like to hear rough schedule of preparation for this beam background overlay.

A: Background overlay would be interesting for tracking studies but it is hard to imagine where we can record realistic background before the real experiment.

Questions by software coordinators (4)

Q: *misalignment*

If misalignment has to be considered in your detector, please start to think how to treat them in simulation and MC/data reconstruction, e.g. what kind of information is needed to implement the misalignment effect (such as local/global misalignment parameters in Belle SVD, maybe wire sag in CDC, displacement of the scintillators/crystals) (Software group will discuss the implementation method with you) Please make a plan and let us know.

A: The present geometry implementation has misalignment parameters for sensors within ladders/ladders within SVD. Do we need to consider gravity sag? Shall we consider misalignment at the digitization step, or already in simulation? To be clarified with alignment people (DESY) by the time of the next tracking meeting (before March B2GM).

Questions by software coordinators (5)

Q: *reconstruction (clusterization)*

Some of sub-detectors (e.g. SVD, ECL in Belle) need a clusterizing procedure. It is related to the reconstruction tools, e.g. tracking, pi0/gamma reconstruction, etc. Please provide us a schedule of development for clusterization. If you do not need any this kind of tools, please let us know.

A: The SVD clusterizer has been implemented together with the digitizer. Also here, validation/tuning with testbeam data is necessary. Possible further developments: Move from the center-of-gravity algorithm to more sophisticated algorithms which consider the angle of the track.

Questions by software coordinators (6)

Q: *detail detector geometry*

So far, the main sensitive materials have been implemented in Belle II detector simulation thanks to each sub-detector group's efforts. But still we need to install more detailed material, especially within the acceptance, e.g. support structure, cooling pipes, cables, etc. Maybe, the final detector design has not been fixed yet for some detectors, but please let us know by when you can implement most of these materials. (the tuning of the material implementation has to be done after the beam collision, of course)

A: The present SVD geometry implementation also includes non-sensitive material but it is probably not complete yet. Is the material budget roughly correct (important for realistic tracking simulation)?

Thank you!