

PacMC Status Update and Plans

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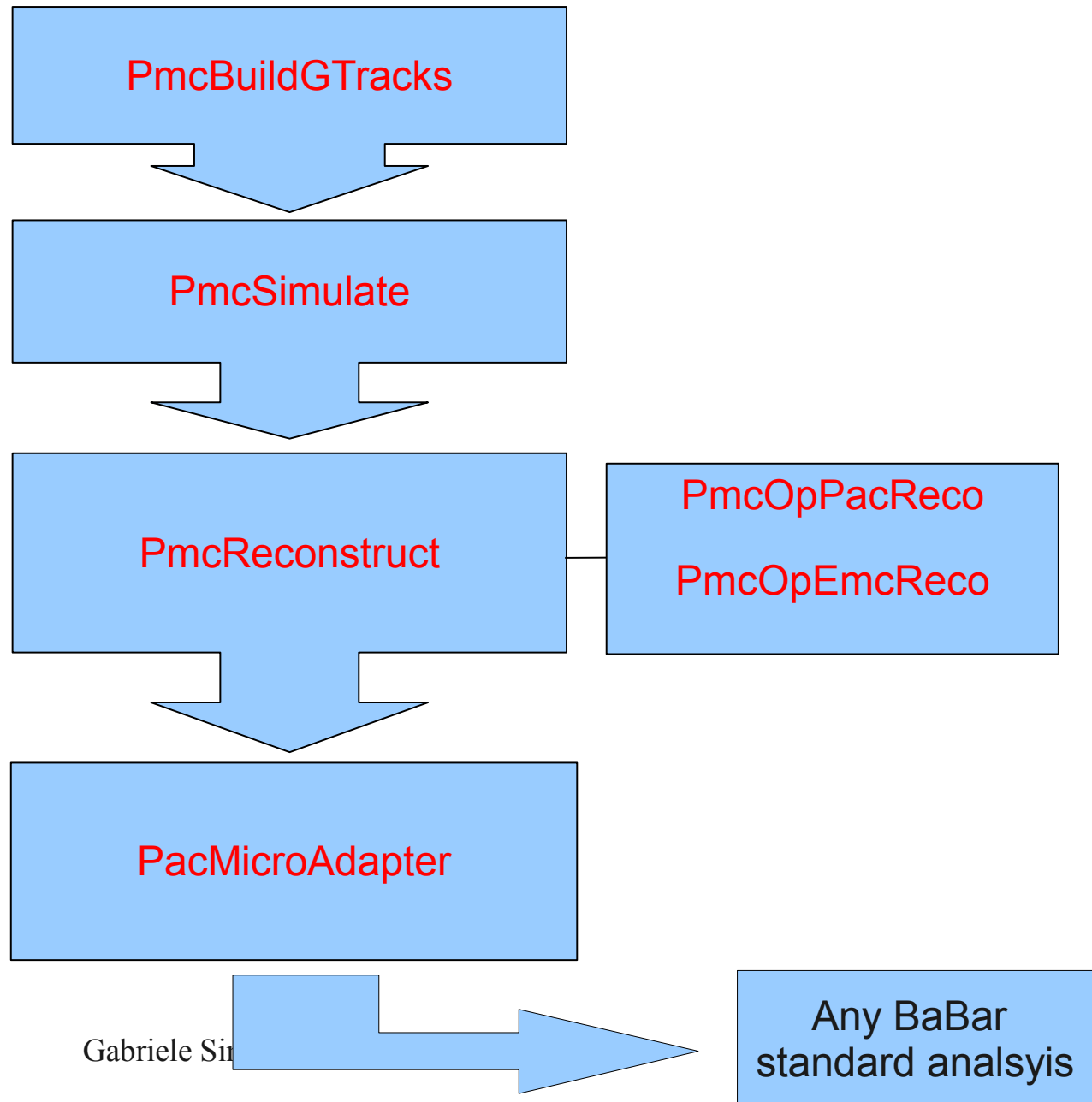
- Update Since Elba
- Recent developments
- SuperB Beams
- Decays in flight
- Basic Reconstruction objects
- Reconstruction sequence

Update

- PacMC is the framework where all the pieces of the fast-simulation are put at work together
- It evolved from PravdaMC by restructuring and intergrating with PACRAT
- It generates events trough EvtGen, runs the particles through the simulation and produces a list of BetaCandidate that are suitable for any standard BaBar analysis

PacMC structure

Generation:
use EvtGen or any
other BaBar generator



Recent Developments

- Addition of SuperB beam parameters
- CDR sec 3.1
 - Beams: $E_{her} = 7\text{GeV}$, $E_{ler} = 4\text{GeV}$
 - beta $(0, 0, 0.272727)$
 - Beam Spot $(0.0, 0.0, 0.0)$
 - B.S. Covariance Matrix:
 - $3.20016e-07$ 0 0
 - 0 $1.225e-11$ 0
 - 0 0 0.00110732

Decays in Flight

- During the simulation step we generate the decays and we append the decay product to the end of the list of the particles to simulate.
- PacDKXXX classes are used to generate the decays. Some parts conflicts with EvtGen.
- Problem: EvtGen is essentially fortran code wrapped into C++, using static data members to mimic the common block
- Copied the needed routines to PacSim: promising but needs more testing

Material Interactions

- Same approach as for decays in flight
- Placeholder exists , need lower level code

Plans: Basic Reconstruction Objects

- Problem: the objects that are the actual output of the reconstruction (TrkRecoTrk, AbsRecoCalo) are not stored into the final BtaCandidates. Only the micro level information is stored.
- This is a legacy of the design of PravdaMC where these objects were not created.
- These are necessary for example to properly account for energy loss when reconstructing KS->pipi
- Need to change structure of BtaCandidate creation

Plans: Reconstruction Sequence

- At the moment the reconstruction is performed in a single pass through the generated particles.
- It is possible to separate this task in several modules that communicate through the event
- This would be slower
- However it might be useful for some purposes
 - Hit overlap and hit confusion (?)

Conclusions

- PacMC has evolved from PravdaMC by restructuring and integrating with PACTRK
- Added SuperB beams
- Added place holders for decays in flight and material interactions
- Plans to change BtaCandidate creation
- Plans to separate the reconstruction step in various modules