

# BT status and plans

## Delivered

Topic	Software update	Description	Notes
TKR Digi	TkrDigi v2r6	includes charge sharing and ion signal	two available routines, not enough to recover TKR hit deficit in MC
ACD Digi	GR-v11	better single photo-electron signal simulation by extending Poisson fluctuations to first dynodes amplification	
CAL Calibration Procedure	column-wise charge injection in CAL CPT online scripts	correct non-linearities in charge injection	improved CAL calibration but did not solve energy shift; will be default calibration mode for the LAT, not relevant for simulation
CalRecon	GR-v11	correct logs and inter-range cross-talk	require mapping of cross-talk for the LAT
Hadronic physics list	GR-v12		improved model for hadronic interactions (Bertini model up to 10GeV, QGSP model up to 20GeV)
TKR material audit	GR-v12	real TKR thin converter thickness	8% lower wrt to original design

## List of planned deliverables and expected delivery

Topic	Expected delivery	Description	Notes
TKR material audit	end september	update mass of passive material to real values from measurements	known missing mass in current model mostly around active area
CAL material audit	end september	check and update CAL mass and materials	preliminary surveys indicate good model
TKR alignment in MC	quick fix available in GR-v12	fix bug in MC alignment	checking out alternative alignment strategy
New mass simulation	end september	with latest sim-recon package	will be used to re-evaluate TKR hits deficit and CAL energy shift in simulation
Special TKR geometry simulation	in progress	vacuum layer between silicon layers and tray core	performed to check penetration of delta rays in a more realistic geometry; preliminary results indicate little effect on TKR hits
Low-energy simulations	in progress	systematic test of LE EM physics list in G4 and range cutoff studies	preliminary results indicate no effect of range cutoffs and a non-perfect control of LE physics list in our simulation
background simulations with higher TKR hits	end september	increase artificially number of TKR hits to mimic BT data	will use alignment bug and will check effect on background rejection
background simulation with shifted CAL energies	end september	artificially scale simulated CAL energies and most important CAL variables to mimic BT data	will check effect on background rejection and reconstruction algorithms
final best physics list	november	final MC tuning	should flow into the Service Challenge 1 year run. it will include best physics list and modification to geometry

## Currently planned MC checks:

- restate data/MC agreement with v7 MC for CAL
- cross-check TKR PSF and HIT summary posted in the agenda on october 17
  - check effect of the extra neutral vertex on the PSF - any bias introduced?
  - double check beam spot from David P for all simulated runs
  - check cerenkov pressure for run at 200GeV - Johan found it was wrong?
- verify alignment effect in v7
  - seems negligible from Johan MC-MC comparison (links on [Good Runs](#)), while cerenkov pressure seem to have been wrong in earlier MC
  - systematically check cerenkov pressure systematics with a scan
- verify effect of cuts on hit deficit
  - run 1 sim with extended beam spot and cut on different parts to check possible effects
  - apply nicola's cuts on beam spot plot and check if special spots are selected
  - add fiducial cuts in the selection?
- smearing routine to align CAL MC variables to data values
- scan extra material along beam line after above realignment