

How to add average BCM current values into the event tree

- New physics module has been just added

THcAerogel.cxx	Modify Aerogel, Cherenkov, ShowerArray and ShowerPlane	2 months ago
THcAerogel.h	Modify Aerogel, Cherenkov, ShowerArray and ShowerPlane	2 months ago
THcAerogelHit.cxx	Removed trailing whitespace from all hcana source files.	a year ago
THcAerogelHit.h	Removed trailing whitespace from all hcana source files.	a year ago
THcAnalyzer.cxx	Doxygen updates. Add \brief to many classes.	6 months ago
THcAnalyzer.h	Removed trailing whitespace from all hcana source files.	a year ago
THcBCMCurrent.cxx	Add new physics module to check BCM current for each event	a minute ago
THcBCMCurrent.h	Add new physics module to check BCM current for each event	a minute ago
THcCherenkov.cxx	Modify Aerogel, Cherenkov, ShowerArray and ShowerPlane	2 months ago
THcCherenkov.h	Modify Aerogel, Cherenkov, ShowerArray and ShowerPlane	2 months ago
THcCherenkovHit.cxx	Removed trailing whitespace from all hcana source files.	a year ago
THcCherenkovHit.h	Removed trailing whitespace from all hcana source files.	a year ago
THcConfigEvtHandler.cxx	THcHitlist finds THcConfigEvtHandler (Event 125) by type instead of n...	2 months ago
THcConfigEvtHandler.h	Create Hall C style parameters from ev 125 run configuration data	3 months ago
THcDC.cxx	Suppress missing ref time messages when ref time not expected	2 months ago
THcDC.h	Suppress missing ref time messages when ref time not expected	2 months ago

How to add average BCM current values into the event tree

- Run `bcm_current_calib` script over a scaler data file to create a parameter file for the Run# you want
- Go to:
`hallc_replay/CALIBRATION/bcm_current_calib/`

```
1  R__LOAD_LIBRARY(ScalerCalib_C)
2
3  void run(string fin="fin.root")
4  {
5
6      //H: HMS, P: SHMS
7      ScalerCalib scalib("H");    ← Do ScalerCalib scalib("P") for SHMS
8      scalib.SetInputFile(fin);
9      scalib.SetPrintFlag(1); //0: bcm1 and bcm2 only, 1: all ← Keep it to "1"
10     scalib.Run();
11
12 }
13
```

How to add average BCM current values into the event tree

- The parameter file has arrays of
 - `scal_read_bcm1_current`
 - `scal_read_bcm2_current`
 - `scal_read_bcm4a_current`
 - `scal_read_bcm4b_current`
 - `scal_read_bcm17_current`
 - `scal_read_event`

as well as `num_scal_read` (total # of scaler events)

- THcBCMCurrent reads these parameters and assign the average current values to correct event blocks.
- It also writes event flags for each event by checking the current values of a given BCM with threshold. The current threshold and BCM index set in `gscaler.param` are used.

How to add average BCM current values into the event tree

- Once the parameter file is created:
 - modify .def file (add “block H.bcm.*” into block_vars.def)

- Add these lines in your script:

```
const char* CurrentFileNamePattern = "PARAM/HMS/BCM/CALIB/  
bcmcurrent_%d.param";  
gHcParams->Load(Form(CurrentFileNamePattern, RunNumber));
```

```
THcBCMCurrent* hbc = new THcBCMcurrent(“H.bcm”, “BCM current  
check”)
```

```
gHaPhysics->Add(hbc)
```

```

//Load Global parameters
// Add variables to global list.
gHcParms->Define("gen_run_number", "Run Number", RunNumber);
gHcParms->AddString("g_ctp_database_filename", "DBASE/HMS/STD/standard.database");
// Load variables from files to global list.
gHcParms->Load(gHcParms->GetString("g_ctp_database_filename"), RunNumber);
// g_ctp_parm_filename and g_decode_map_filename should now be defined.
gHcParms->Load(gHcParms->GetString("g_ctp_kinematics_filename"), RunNumber);
gHcParms->Load(gHcParms->GetString("g_ctp_parm_filename"));
gHcParms->Load(gHcParms->GetString("g_ctp_calib_filename"));
// Load params for HMS trigger configuration
gHcParms->Load("PARAM/TRIG/thms.param");

const char* CurrentFileNamePattern = "PARAM/HMS/BCM/CALIB/bcmcurrent_%d.param";
gHcParms->Load(Form(CurrentFileNamePattern, RunNumber));

```

```

// Add Physics Module to calculate primary (scattered) beam kinematics
THcPrimaryKine* hkin = new THcPrimaryKine("H.kin", "HMS Single Arm Kinematics", "H", "H.rb");
gHaPhysics->Add(hkin);
THcHodoEff* heff = new THcHodoEff("hhodeff", "HMS hodo efficiency", "H.hod");
gHaPhysics->Add(heff);

THcBCMCurrent* hbc = new THcBCMCurrent("H.bcm", "BCM current check");
gHaPhysics->Add(hbc);

// Add handler for prestart event 125.
THcConfigEvtHandler* ev125 = new THcConfigEvtHandler("HC", "Config Event type 125");
gHaEvtHandlers->Add(ev125);

```

Example output

```
root [4] T->Print("H.bcm*")
*****
*Tree   :T           : Hall A Analyzer Output DST                               *
*Entries :   10000   : Total =      283706071 bytes File Size =   35554918 *
*       :           : Tree compression factor =    8.00                       *
*****
*Br     0 :H.bcm.CurrentFlag : H.bcm.CurrentFlag/D                             *
*Entries :   10000   : Total Size=      86460 bytes File Size =     2960 *
*Baskets :    20    : Basket Size=   15872 bytes Compression= 27.57         *
*.....*
*Br     1 :H.bcm.bcm1.AvgCurrent : H.bcm.bcm1.AvgCurrent/D                     *
*Entries :   10000   : Total Size=      82466 bytes File Size =     3907 *
*Baskets :    20    : Basket Size=   15872 bytes Compression= 20.91         *
*.....*
*Br     2 :H.bcm.bcm17.AvgCurrent : H.bcm.bcm17.AvgCurrent/D                   *
*Entries :   10000   : Total Size=      82490 bytes File Size =     3903 *
*Baskets :    20    : Basket Size=   15872 bytes Compression= 20.94         *
*.....*
*Br     3 :H.bcm.bcm2.AvgCurrent : H.bcm.bcm2.AvgCurrent/D                     *
*Entries :   10000   : Total Size=      82466 bytes File Size =     3944 *
*Baskets :    20    : Basket Size=   15872 bytes Compression= 20.72         *
*.....*
*Br     4 :H.bcm.bcm4a.AvgCurrent : H.bcm.bcm4a.AvgCurrent/D                   *
*Entries :   10000   : Total Size=      86590 bytes File Size =     3939 *
*Baskets :    20    : Basket Size=   15872 bytes Compression= 20.75         *
*.....*
*Br     5 :H.bcm.bcm4b.AvgCurrent : H.bcm.bcm4b.AvgCurrent/D                   *
*Entries :   10000   : Total Size=      82490 bytes File Size =     3957 *
*Baskets :    20    : Basket Size=   15872 bytes Compression= 20.65         *
*.....*
root [5]
```