How To Run HKS DC Analysis program

The main program of the HKS DC analysis software is "simple.f". it is a much simplified version of Hall C standard replay, doing decoding for the ADC and TDC signals in the raw data file generated by CODA, converting them into plane number, wire number, time and other physical quantities and doing the tracking to get the positions and angles of particle trajectories passing through the chambers eventually. The program only support one single FastBus crate now.

The sample source code, parameter files, histogram definitions can be found at any JLab central computer under the directory:

/home/yuan/HKS/analysis/

The analysis program can run both on Linux and JLab Central SunOS machines after compilation.

Run the analysis program

1. Copy all the files under that directory to your computer, including the subdirectories: /CTP, /DBASE, /MAPS, /PARAM, /paw and /SRC.

2. change the path name "/home/yuan/HKS/analysis/" in the file "setupsimple" to your own analysis directory. It should look like:

   ```
   export SIMPLE_CONFIG_FILE= <your analysis path name>/SIMPLE.PARM
   ```

   Then

   ```
   >source setupsimple
   ```

   to set the environment variable "SIMPLE_CONFIG_FILE".

3. Copy the raw data file to a place you can get access to from your analysis directory. Currently, all the raw data file from CODA is stored at:

   ```
   vulcano.jlab.org: /home/cdaq/gen01/coda2/data/hks03_<run#>.log
   ```

   Then tell the program where it can find the raw data file in the file "SIMPLE.PARM":

   ```
   data_file= '<path and file name of the raw data file>'
   ```

4. Launch the program by:

   ```
   >./simple grun=<run #> [gstart= #] [gmax=#]
   ```

   where the options "grun=" specifies the run number, "gstart=" how many events you want to skip, "gmax=" total events you want to analyze.

The output histograms is written in "/paw" directory by name "<run#>.hbook". You can find all the histogram names in "paw<run#>.kumac". At present, the defined histograms include: raw TDC channel map, DC wire maps, drift time distributions, drift distance distributions, track fitting residues, fitting chisquare, (virtual) reconstruction plane coordinates X vs Y, angles Xp vs Yp.

Recompile the executable "simple" in your own computer

To recompile the executable "simple", you need to get access to Hall C CTP program library and CERN Libraries. In JLab central computers, they are under directory "/group/hallc/Csoft" and "/site/cernlib".

In the "/SRC" subdirectory under your analysis directory, use commands:

```
>make clean
>make
```

```
Then go one level up the directory and type:

   >ln -s SRC/simple_Linux  simple            or,
   >ln -s SRC/simple_SunOS  simple

depend on the operation system of your computer.

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```