

Systematic Studies

status, procedures, quality checks, organization & documentation

Purpose of this talk: What do we need to complete the systematic studies in the next few months?

- Requires an understanding of the process.

- Procedures & quality checks
- Documentation
 - What documentation is there
 - What's missing
- Organization
 - How are things organized
 - What else can be done
- Problems and sources of error
 - List
 - How to avoid them
- Tasks & Man power
 - How much man power is needed
 - Splitting of tasks
- Status
 - Where are we now
 - How much more do we have to do
- Time estimates

Procedures & Quality Checks

- Obtaining the trees
 - Create a weekly plan
 - Prepare ffcards file, kcm file(s), executables, e614.com (contains input calibration files, etc).
 - Submit jobs
 - Monitor progress, resubmit failed jobs, etc.
- Tree quality checking
 - Run scripts to check tree integrity including
 - Check that the tree file for a given run exists
 - Check that the run terminated normally (previous problem with unfinished runs)
 - Check for zombie trees
 - Check data quality (using Jingliang's list)
 - Create goodlinks and badlinks
 - Include lists of good runs and bad runs
 - Used for root tree summing

Procedures & Quality Checks

- Root tree summing to obtain an endpoint spectrum
- Energy calibrations (fitting the endpoint spectrum)
- Root tree summing with energy calibrations applied to obtain p vs $\cos(\theta)$ histogram for MP fit
- Pre-fitting quality checks – not applied consistently
 - Do a ‘diff’ between the ffcards for the base set and the test set and save in a text file
 - Does the difference correspond to the systematic being studied
 - Do a ‘diff’ between the kcm file for the base set and the test set and save in a text file
 - Does the difference correspond to the systematic being studied
 - Example of how problems may arise: dead zone created but not turned on!
 - Overlay $\cos(\theta)$ and momentum histograms for the test set and the base and the differences
 - Determine if sets are independent, semi-dependent, or independent
- Fitting

Documentation

- Systematics web pages: what's there?
 - Westgrid weekly plan
 - List a systematic test and assign a number
 - MC sets
 - Description, executable used, number of runs
 - Data sets
 - Description, executable used, number of runs
 - MC energy calibrations
 - List of energy calibration parameters
 - See how they vary between the different systematics sets
 - Data energy calibrations
 - List of energy calibration parameters
 - See how they vary between the different systematics sets
 - Tags and executable
 - Description of code tags and executables used on westgrid
 - Instructions
 - Need a lot of work
 - Table of systematics – raw results
 - Links to set descriptions, etc.
 - Spread sheet – processed result
- All web pages can benefit from a constant update!!

Problems Encountered

- Problems include
 - Westgrid problems
 - Various failures (recently a lot of GPFS file system failures).
 - Changes and modifications (new scripts that mistakenly killed our jobs, changes to file protection & ownership).
 - Archiving and retrieving problems (DSM and guide crashes).
 - Script problems
 - Inadequate scripts (require a lot of manual work)
 - Bugs as scripts are modified
 - Full disks
 - Causing runs to crash (requires disk cleanup and re-submission)
 - Poorly prepared sets
 - Mistakes in ffcards files
 - Mistakes in kcm files
 - Bugs in executables
 - Wrong calibration files in e614.com
 - Local tape drive failure(s)
 - Poor organization and instructions
 - Web pages are not up to date

Solutions

- Westgrid problems
 - Continue to participate in the weekly meetings and report all problems to the Westgrid people
- Script problems
 - Inadequate scripts (require a lot of manual work) – create better scripts
 - Bugs as scripts are modified – tests scripts carefully before putting them to use
- Local tape drive failure(s) – have to live with, not serious
- Full disks
- Poorly prepared sets
- Mistakes in ffcards files
- Mistakes in kcm files
- Bugs in executables
- Wrong calibration files in e614.com
- Poor organization and instructions
- Web pages are not up to date

Two solutions:

- More manpower
- Split tasks – less overlap

Tasks & Manpower Proposal

Westgrid plan	Maier
Job preparations and submissions	Dick, Jingliang
Disk space, archiving	Jingliang
Scripting	Jingliang
Data review and transfer	Rob
Tree quality checks	Ryan
Tree summing	Ryan
Energy calibrations	Brynle, Maier
Tree resumming	Ryan
Histogram checking	Brynle, Maier
Directory organization, etc.	Maier
Web pages update	Maier
Web pages verifications	Everyone!
Westgrid issues	Art, Renee
Executables & code preparations	Jingliang, Blair & Maier
FFCARDS and kcm file differences	Blair & Maier
Root macros (tree summing)	Blair
Fitting	Blair & Maier

Status - processing

Monte Carlo

- **(DONE)** Tree quality checking
 - **(DONE)** Run scripts to check tree integrity
 - **(DONE)** Create goodlinks and badlinks
- **(DONE)** Root tree summing to obtain an endpoint spectrum
- **(HALF DONE)** Energy calibrations (fitting the endpoint spectrum)
- **(HALF DONE)** Root tree summing with energy calibrations applied to obtain p vs $\cos(\theta)$ histogram for MP fit
- **(NOT DONE)** Pre-fitting quality checks – not applied consistently
 - Do a “diff” between the fcards for the base set and the test set and save in a text file
 - Does the difference correspond to the systematic being studied
 - Do a “diff” between the kcm file for the base set and the test set and save in a text file
 - Does the difference correspond to the systematic being studied
 - Example of how problems may arise: dead zone created but not turned on!
 - Overlay $\cos(q)$ and momentum histograms for the test set and the base and the differences
- **(NOT DONE)** Fitting

Data

- **All data sets are only partially done!**

Status – Westgrid running

- Lists of what has been done was presented throughout and a semi completed list is on the web pages
- Currently on the plan list
 - Double muon beam rate
 - Double positron beam rate
 - Randomize plane z positions
 - Randomize wire spacing
 - Analysis of uniform field for positrons only with a non-uniform field
 - 200 micron resolution in tracking
 - 50 micron resolution in tracking
 - Temperature lowered by 10% in ffcards (done?)
 - B2 + 10 G (done?)
 - B2 – 10 G (done?)
 - Few sets related to DS AI

