

Debugging

When Things Go Wrong

What is the Nature of the Problem?

- Results not as expected
 - Poor alignments
 - Averages “look wrong”
 - Warning messages need checking
- Run fails to complete
 - Typically one or more error messages
 - Incorrect setting or file format
 - Index out of range
 - A software bug

In Either Case...

- Double-check your settings
- Get a good night's sleep, and triple-check!!!
- “That’s not at all what I meant to enter” is probably the most common source of problems!
- Re-checking settings is always recommended, even when no problems are apparent

Warnings and Errors Log File

- *WarningsAndErrors.log
 - Summary of all warnings and errors
 - Pointers to examples in individual log files
- Caution: some rare errors prevent creation of this summary log file or make it inaccurate
 - Can always check individual logs
 - `grep ERROR *.log`
 - `grep WARNING *.log`

Results Not As Expected

- Check log files
- At what stage does the problem first appear?
 - Do the initial reference and mask look good?
 - A no-search 1st iteration can verify correct setup of model and initial motive list.
 - Do the references improve monotonically?
- Is the search strategy appropriate?
- Identifying and understanding the earliest sign of trouble will often lead to a solution.

Run Fails to Complete

- A hierarchy of possible failure types
 - Warnings: possible problem, but run continues
 - PEET warnings are prefixed with "WARNING:"
 - Error: run can not continue
 - "Good" errors
 - PEET errors are prefixed with ERROR:
 - Anticipated by PEET. Message often clear and actionable.
 - "Bad" errors / crashes
 - Unexpected... segmentation violation, stack dump, etc.
 - Message may be confusing and not be helpful.
 - Always look for the earliest error message
 - Sometimes (not always) simpler

Locating the Earliest Error

- Error using PEETError (line 49)

ERROR:

Usage: averageAll_mce filename iterationNum
desiredOutput [tomNum]

Error in averageAll_mce (line 57)

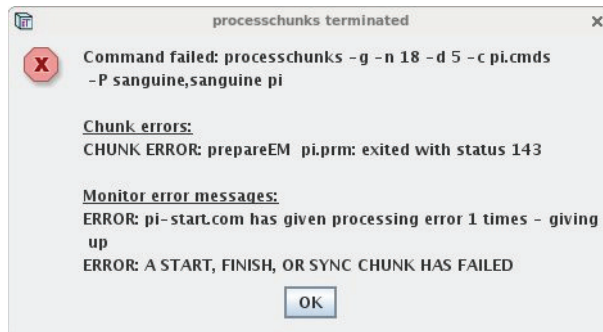
Sample Warnings

- **WARNING:** Best phi was found at the end of the search range!
- **WARNING:** Z axis maximum index out of range by 57 voxels!
- Both of these are common, often harmless
 - End of search range warnings are only a concern if frequent, and if they persist at later iterations.
 - Index out of range warnings usually arise when extracting a reference-sized subvolume near an edge of the volume.

Sample “Good” Errors

- Usage messages
 - ERROR:
Usage: averageAll_mce filename iterationNum desiredOutput [tomNum]
- ERROR: Volumes must have the same voxel size!
 - A volume has incorrect or missing voxel size in header
 - Or you’re trying to combine incompatible volumes...
- ERROR: Motive list size does not match number of model particles!
 - Often caused by incorrect model or MOTL name

Examples of “Bad” Errors



- Index out of range
- Segmentation violation / core dumped

After a Bad Error

- Look for earliest error
 - Operation in progress sometimes gives a clue
- Often, need to send info to us for analysis
 - Press File / Run Tomosnapshot
 - Email or upload resulting snapshot
 - Tomosnapshots are always helpful
 - Screenshots are rarely informative

Submitting Requests for Help

- What were you doing?
- What went wrong?
- OS type and version?
- IMOD and PEET versions?
- Has your configuration changed recently?
 - Software?
 - Hardware?

Questions?