SKA simulations: AIPS++ in a parallel environment on the Swinburne cluster

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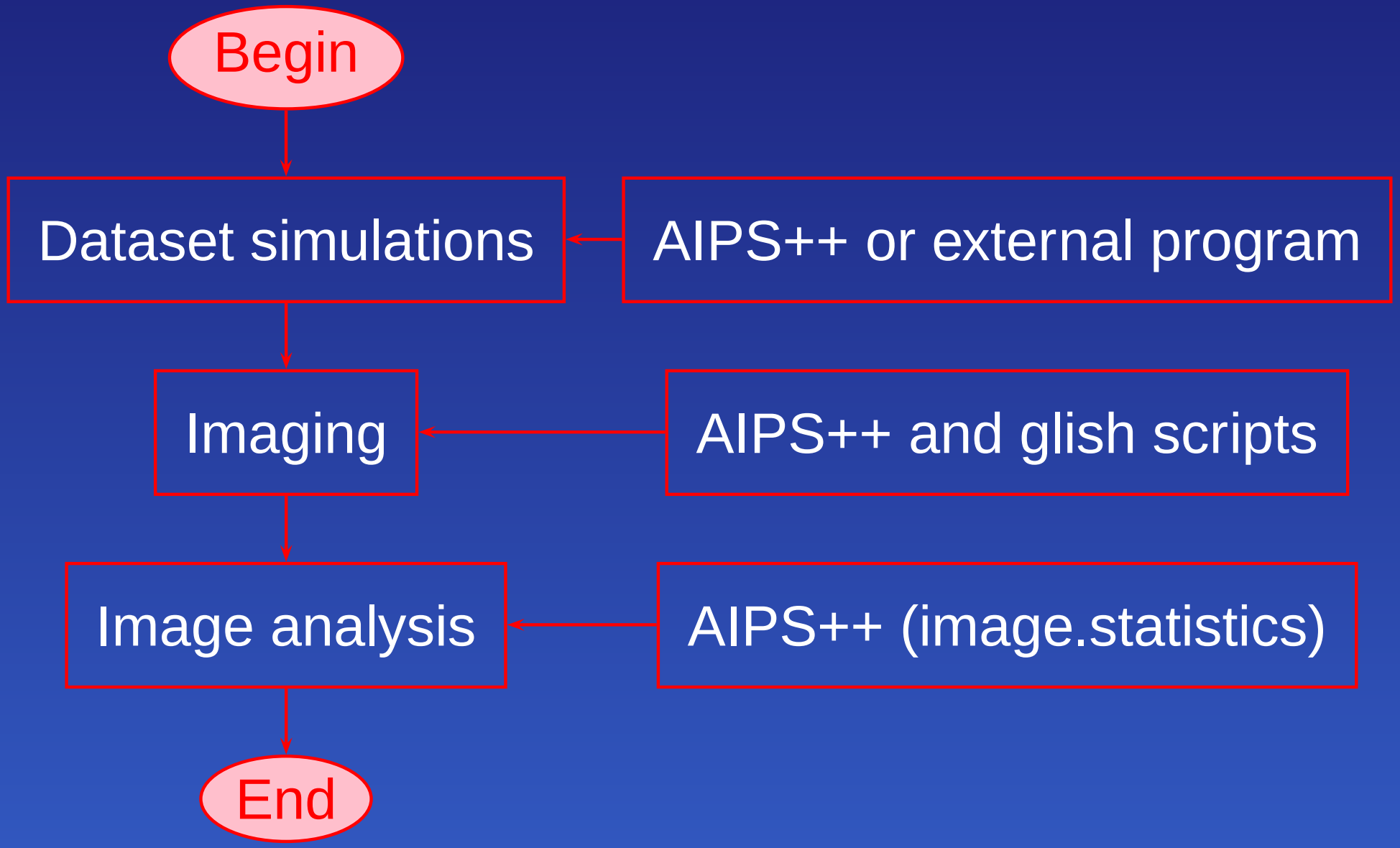
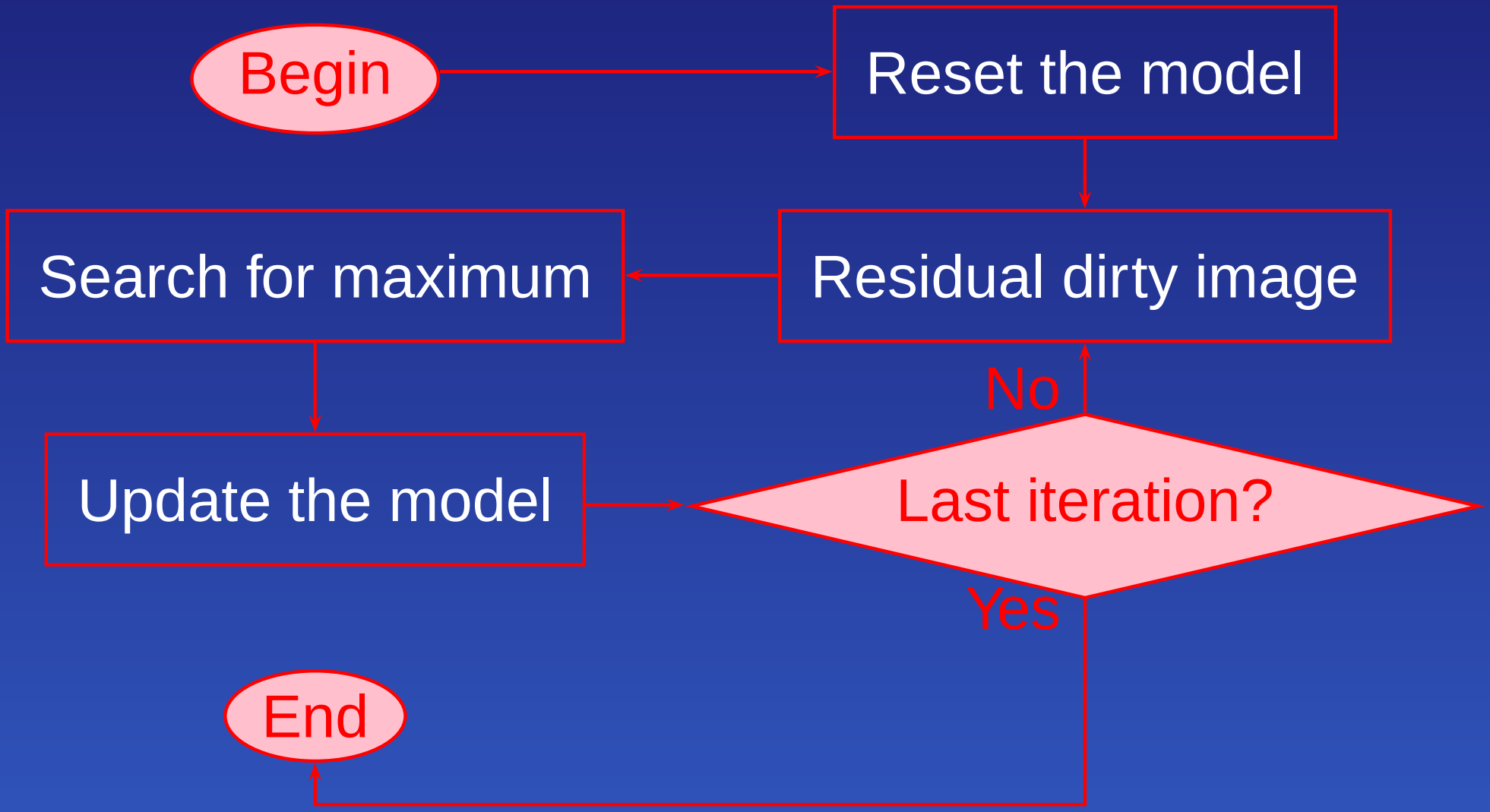
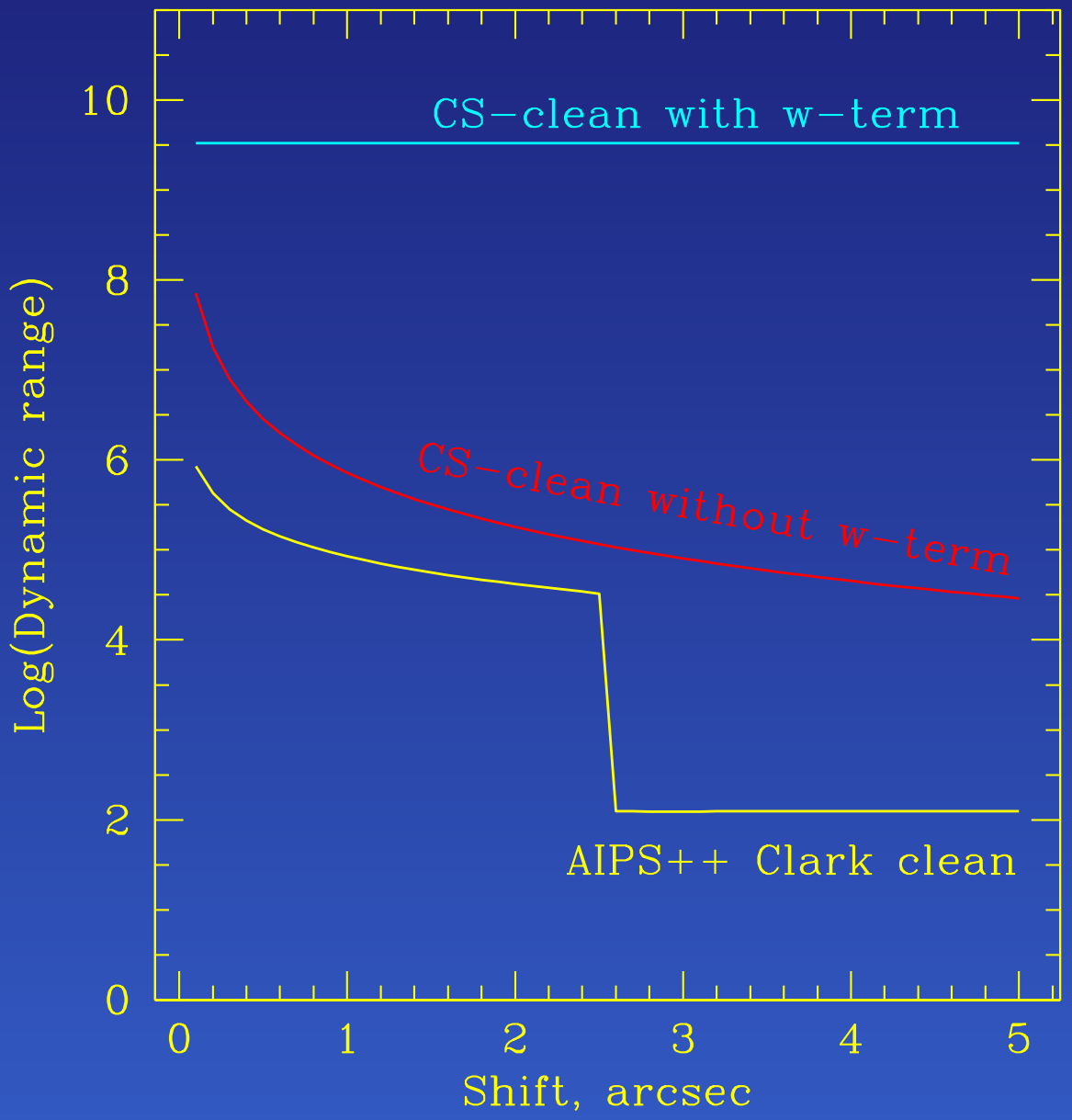
Simulations Flow-chart



Imaging: Cotton-Schwab clean



Dynamic range simulations



AIPS++ on the cluster

- AIPS++ has its own mechanism supporting a parallel environment
  - A special client, named glish daemon, is responsible for start up of the software on an external host
  - The glish daemon can either be started with the root permissions or use rsh
  - For the rsh-based method a proper configuration of .rhosts files is required
- According to the manual, it should be easy to start any glish client (UNIX shell script, glish script or C++ client) on other host

AIPS++ on the cluster: problems

- A glish client is started on other host in a root directory with an uninitialized environment variables
- In principle, there are special events acceptable by glish daemon to change current directory, environment and library path. But there is no predefined variable of the daemon's client available for glish scripts to send such an event.
- Solution: UNIX shell wrapper starting glish script after proper configuration

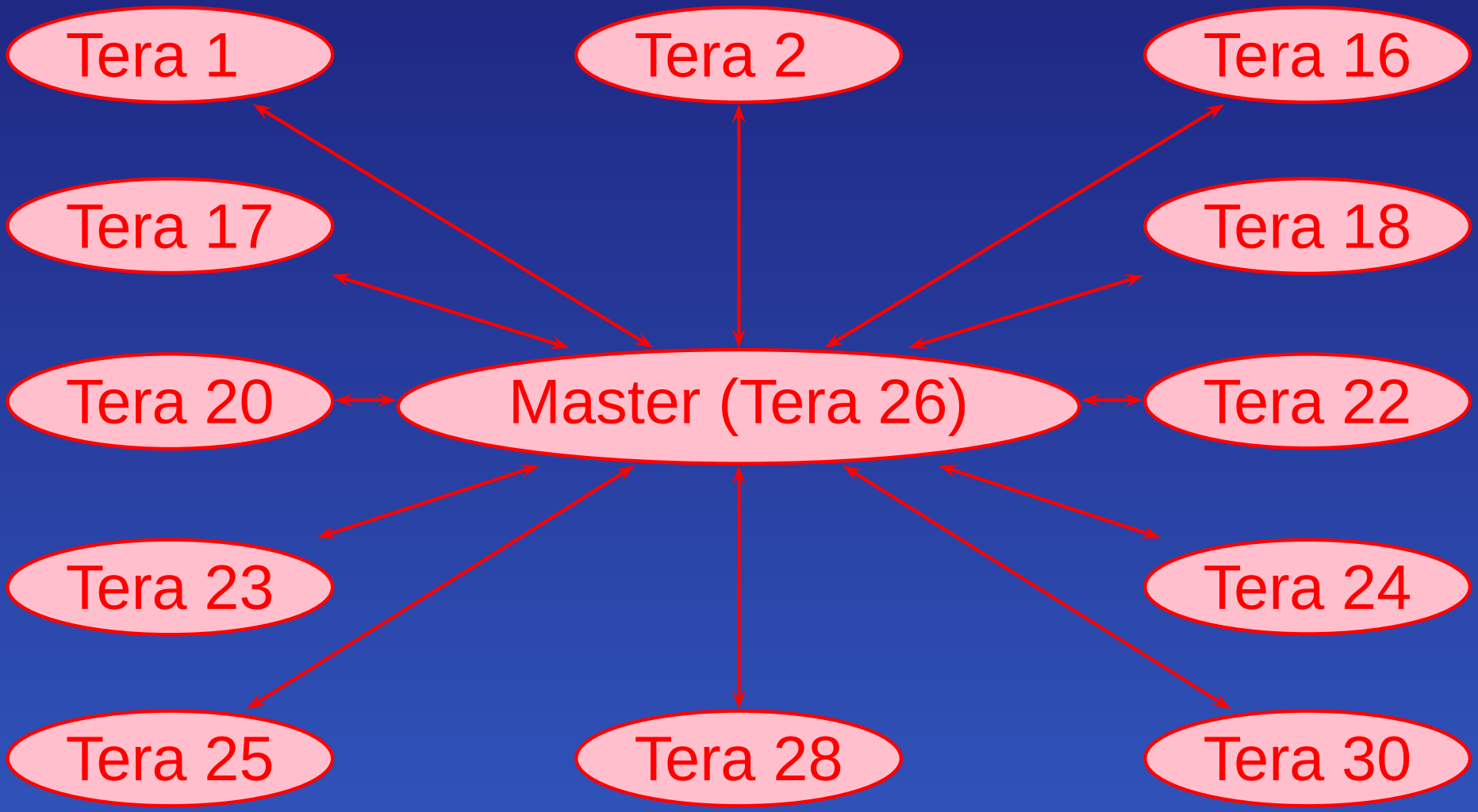
UNIX shell wrapper

```
#!/bin/sh

. /nfs/cluster/src/aips++/stable/aipsinit.sh

cd /nfs/data/‘hostname‘/mvoronkov/
ln -sf /home/cluster/mvoronkov/fileprefix.g ./

glish $@ > /nfs/data/‘hostname‘/mvoronkov/glishoutput.log
```

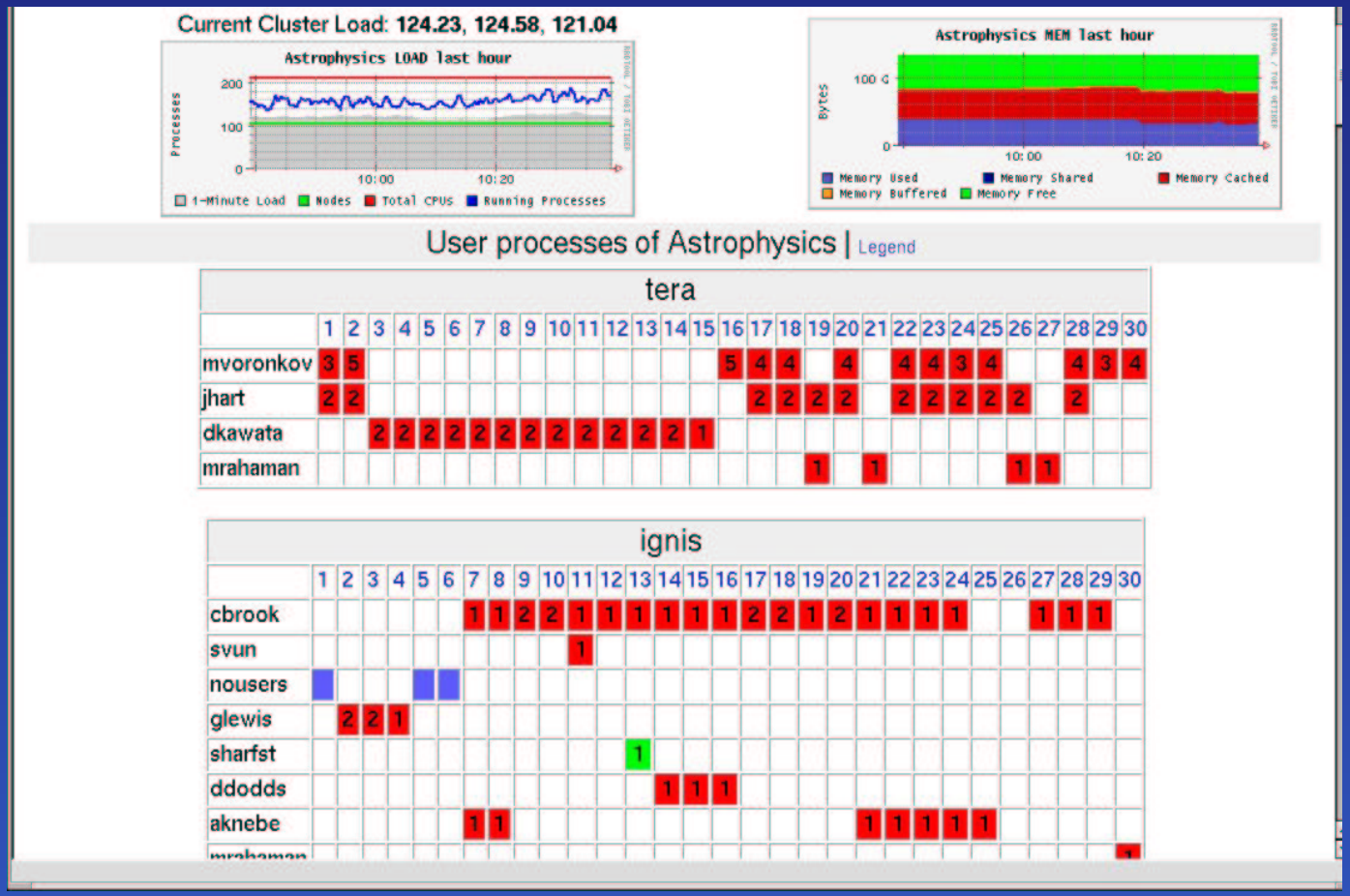
Required client object can be created using

```
nodeclients[i]:=client("glishwrapper pwrapper.g",host=hosts[i]);
```

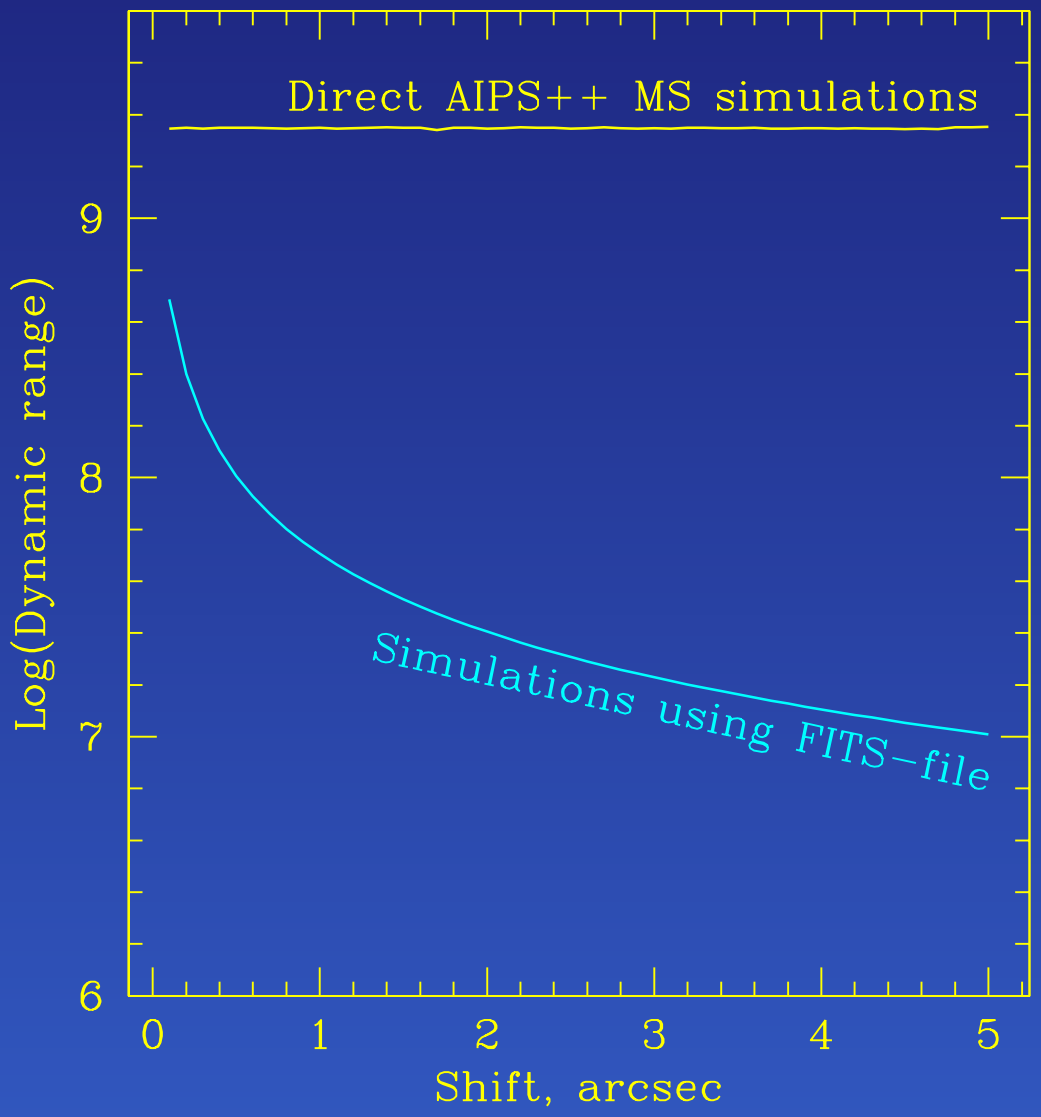
Parallel computations



The Swinburne cluster in use

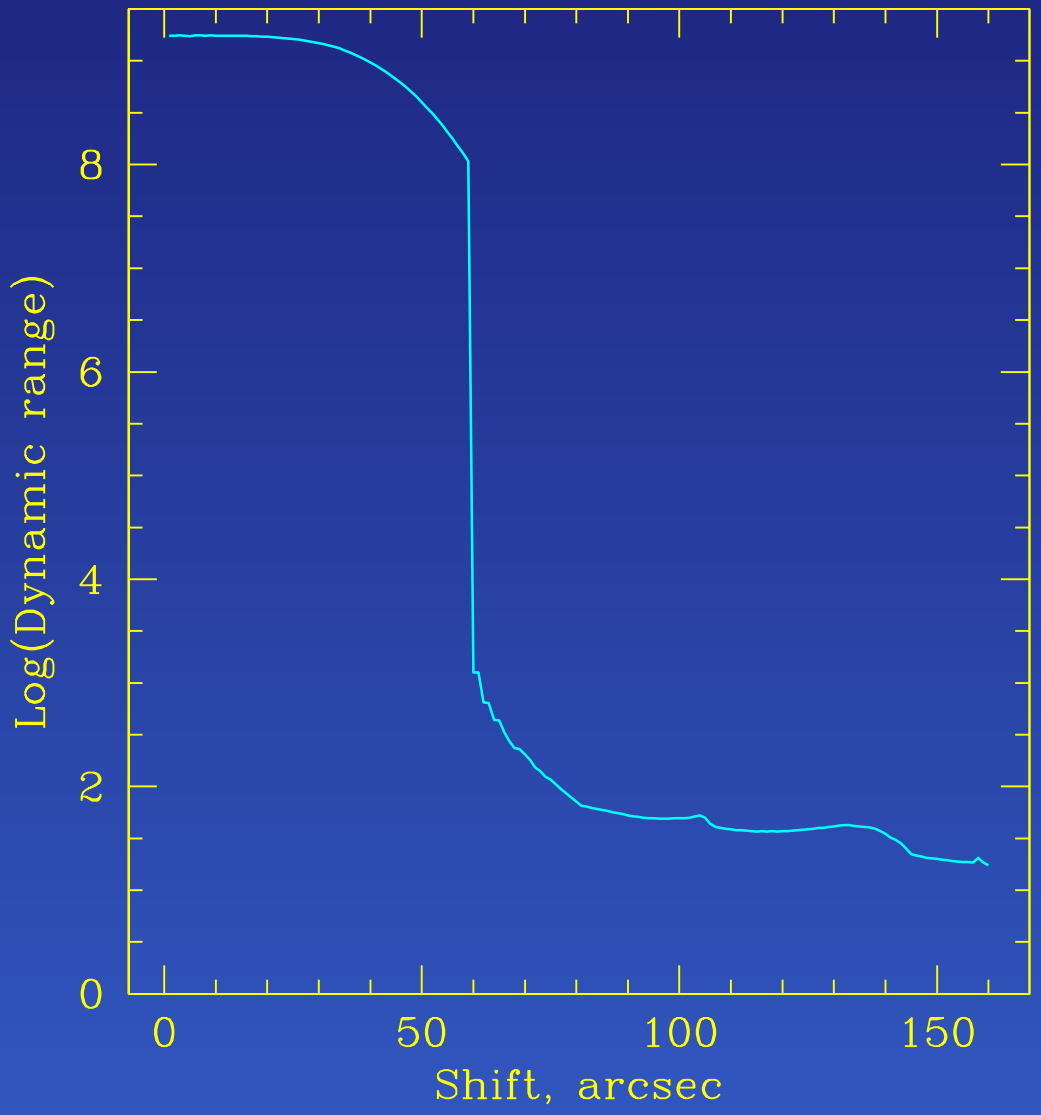


Precision: floats and doubles



AIPS++ currently supports single precision FITS files only

Large image problems: precision?



For considerably large image the dynamic range becomes very low at certain offset. May be this is also an influence of precision.

Conclusions

- AIPS++ is capable with parallel computations.
- Floating point precision is a very important issue, when one would like to get dynamic ranges of about 10^6-10^7. At least u,v and w should be stored as doubles.
- A desirable cluster upgrade for the SKA simulations is more free disk space for private area at each host.