Software - SSS

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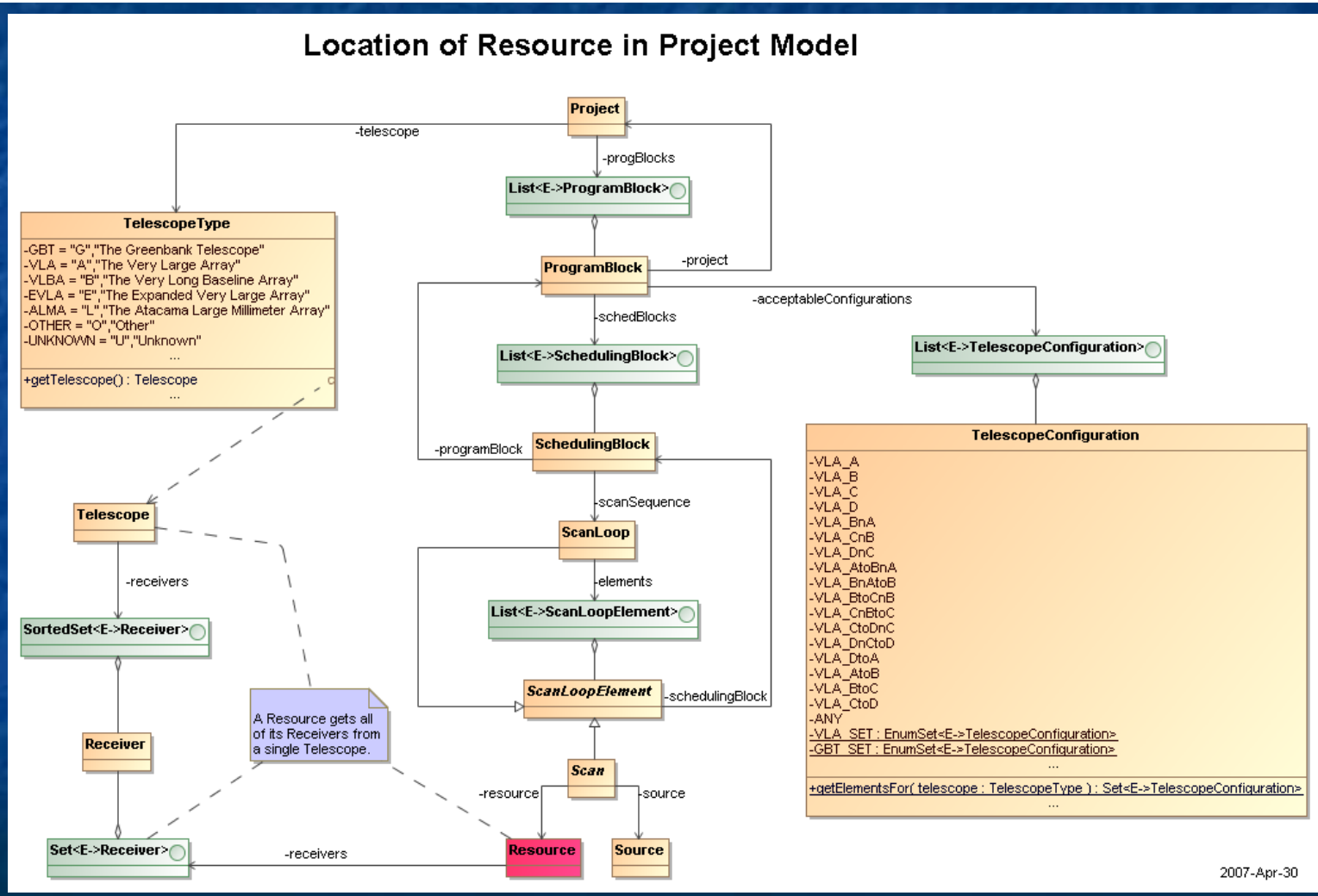
Major Subsystems

- *High Level Architecture (HLA)*
- Portal (user authentication, and gateway)
- Proposal preparation, submission, handling (PST)
- *Observation preparation (OPT)*
- *Array Scheduling (OST)*
- Archive access (AAT)

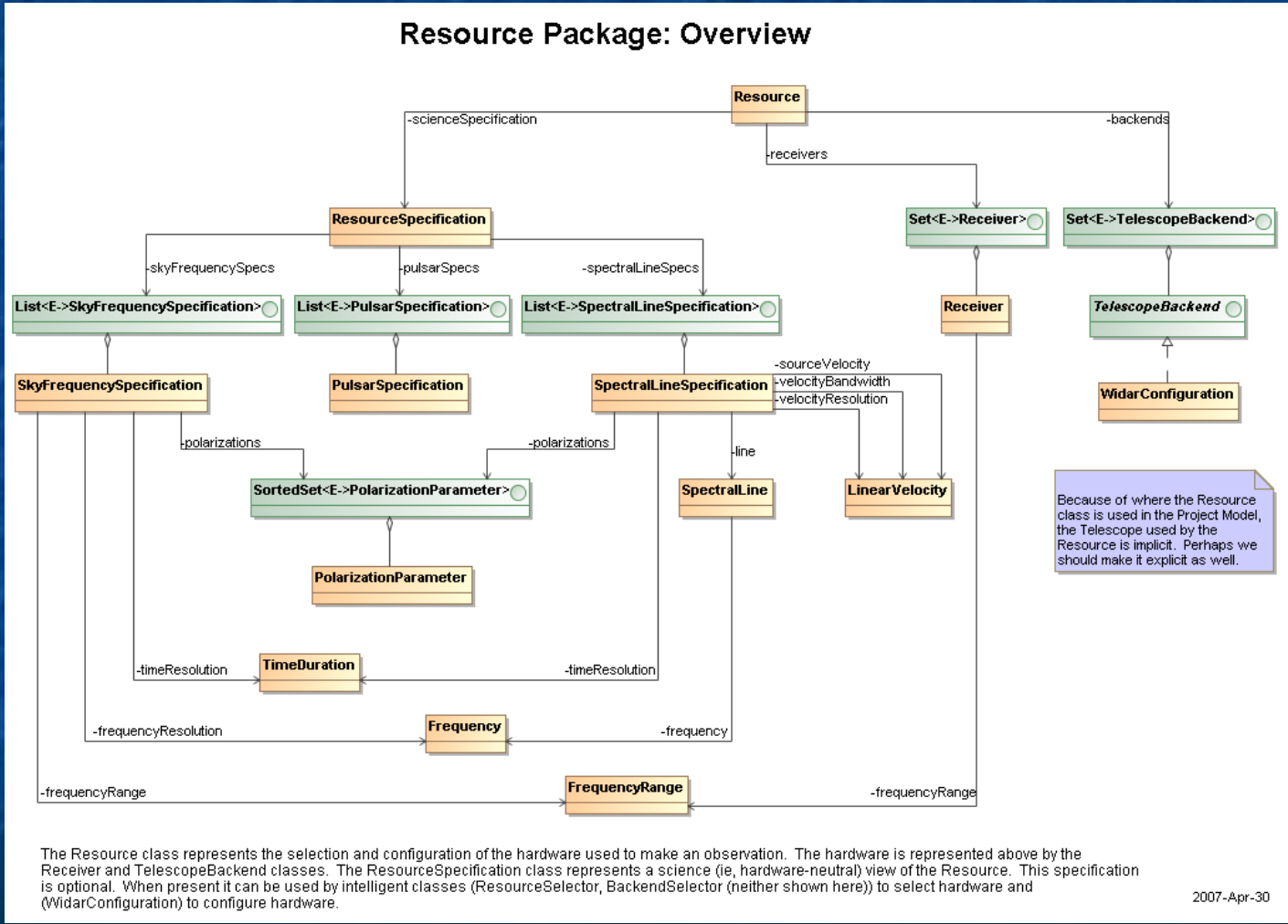
High Level Architecture

- The major subsystems are known (and have been for several years)
- The main task is now in defining the interfaces - we define these as “models” (they are really objects) used within, and passed between, subsystems
- Significant progress has been made in the last 18 months in developing these models, which are common throughout the system as much as they can be, so reused by multiple subsystems
- A caveat is that with distributed development (EVLA, ALMA, EOD), use of “common” models means something different than one might think or hope

Example - Project Model



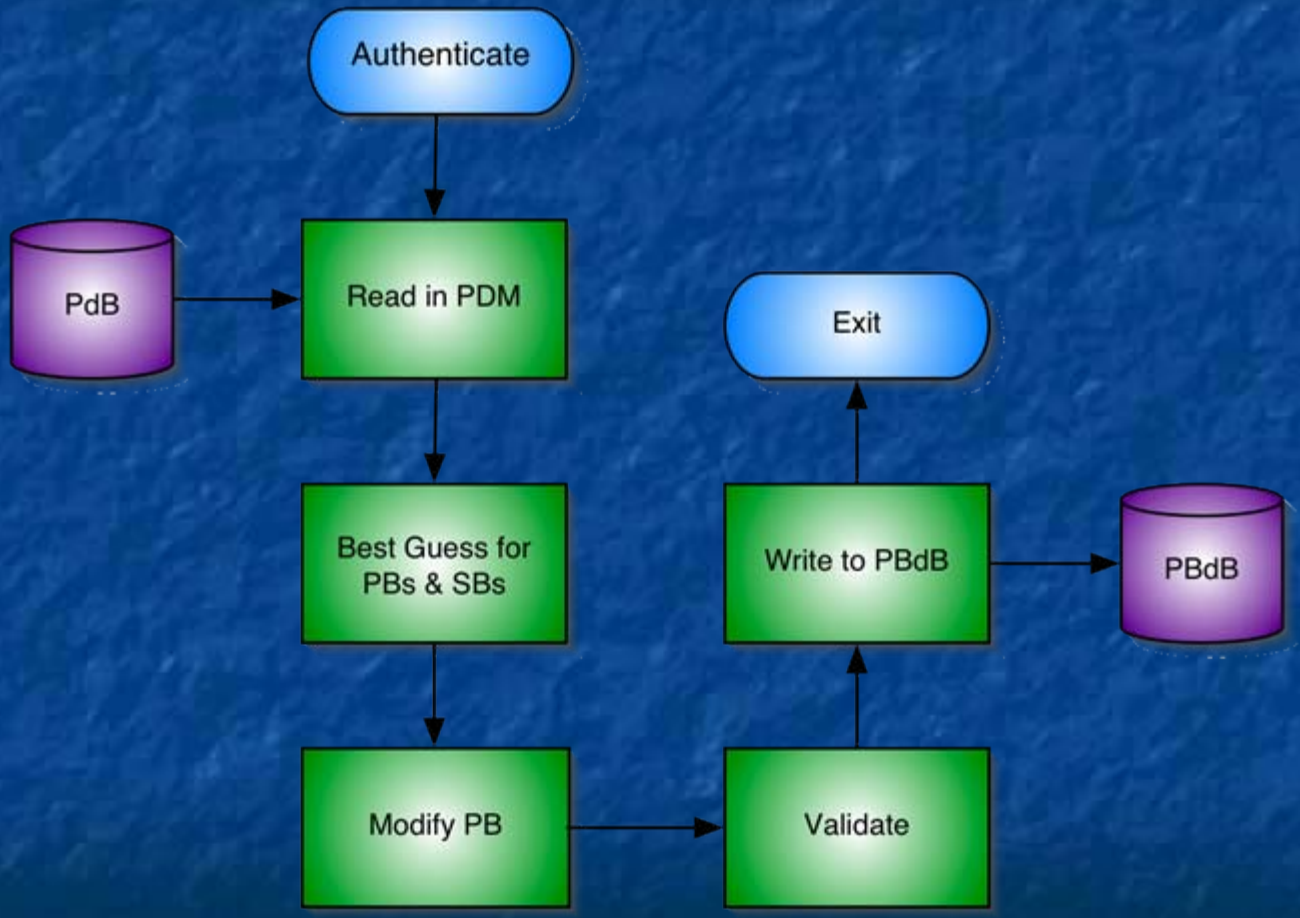
Example - Resource Model



Observation Preparation (OPT)

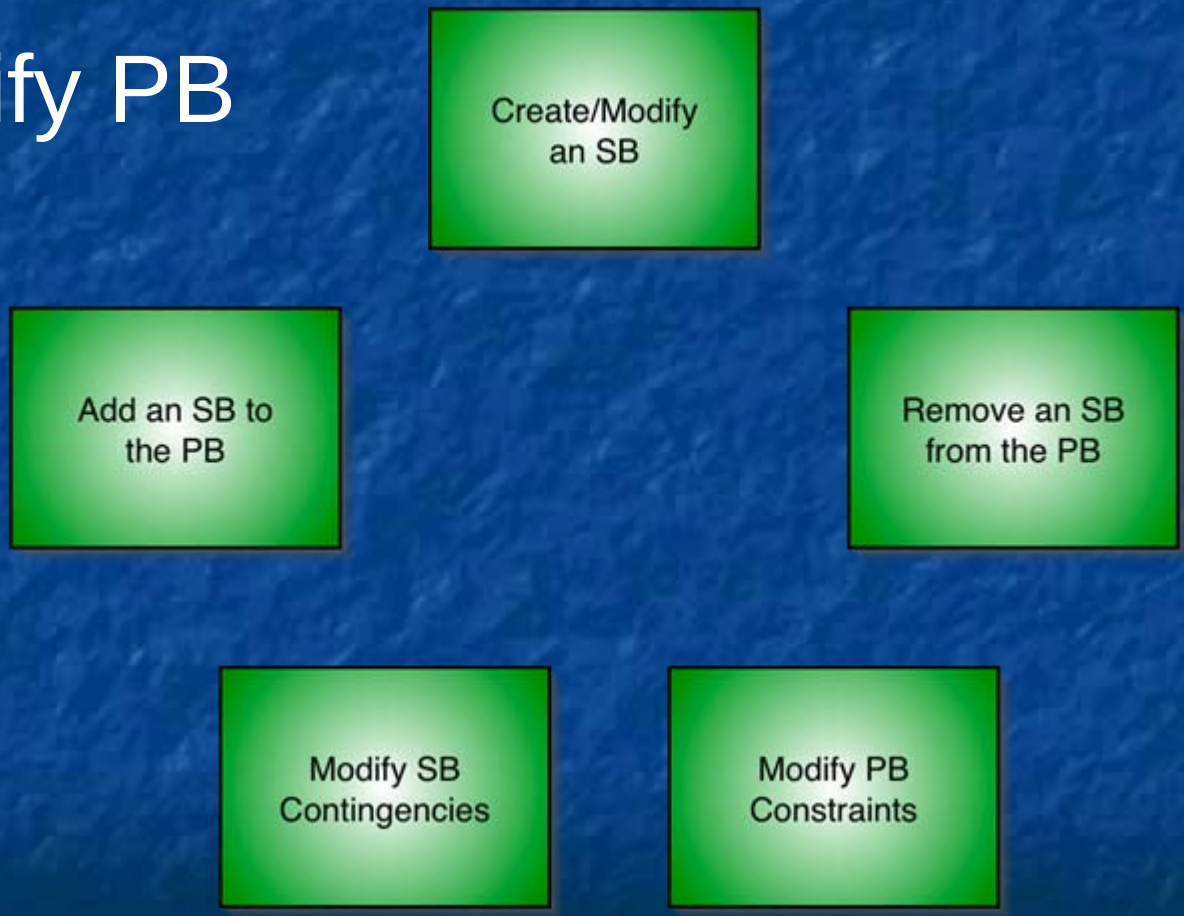
- Converts Project into Program Blocks (PB is a collection of Scheduling Blocks)
- Needs detailed telescope knowledge
- Needs to support 3 “levels” of user:
  - Novice (automatic generation of PBs for “standard modes”)
  - Intermediate (graphical setting of observing parameters)
  - Expert (allow for script level editing)

OPT - Components



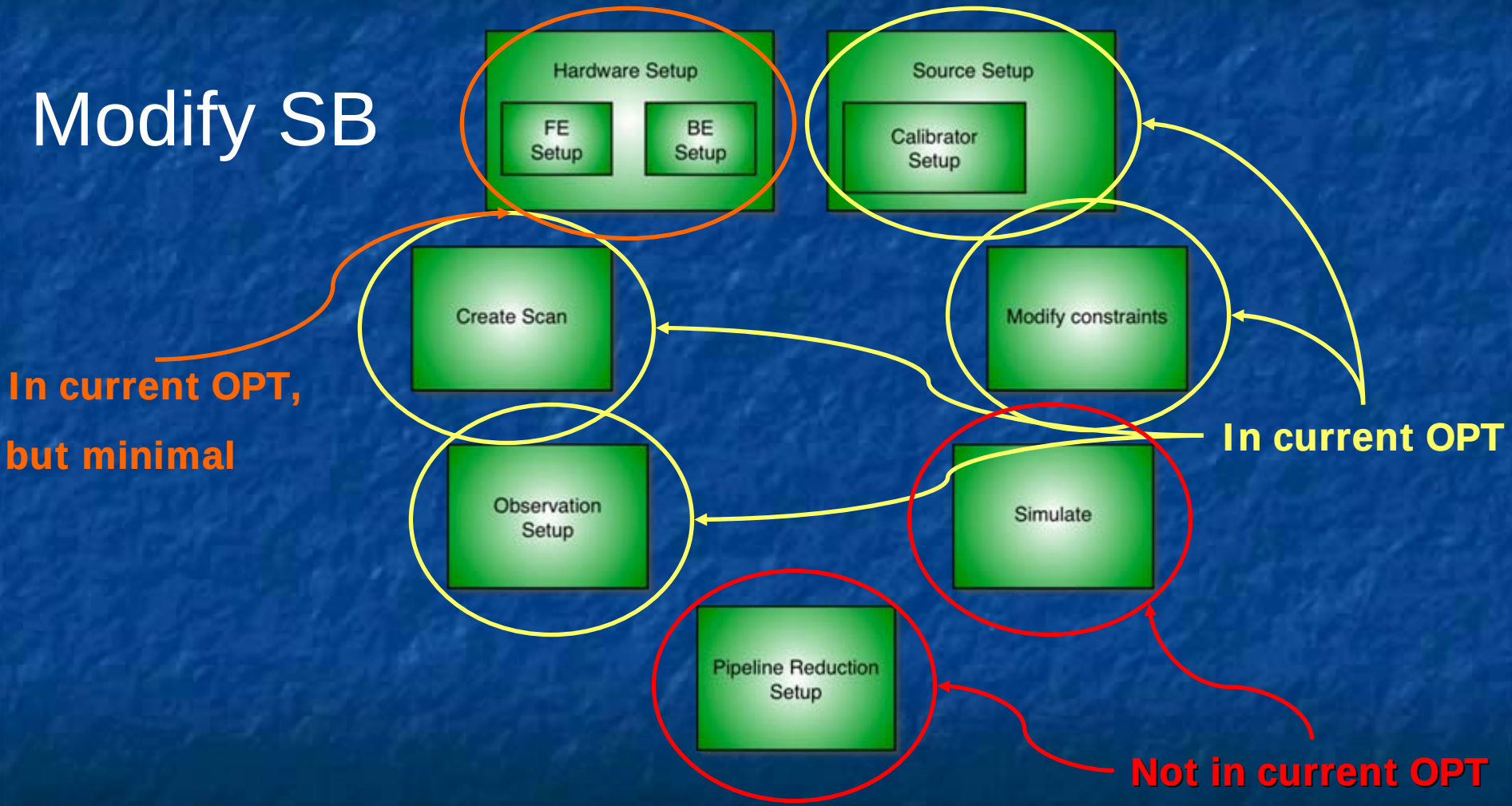
OPT - Components

Modify PB

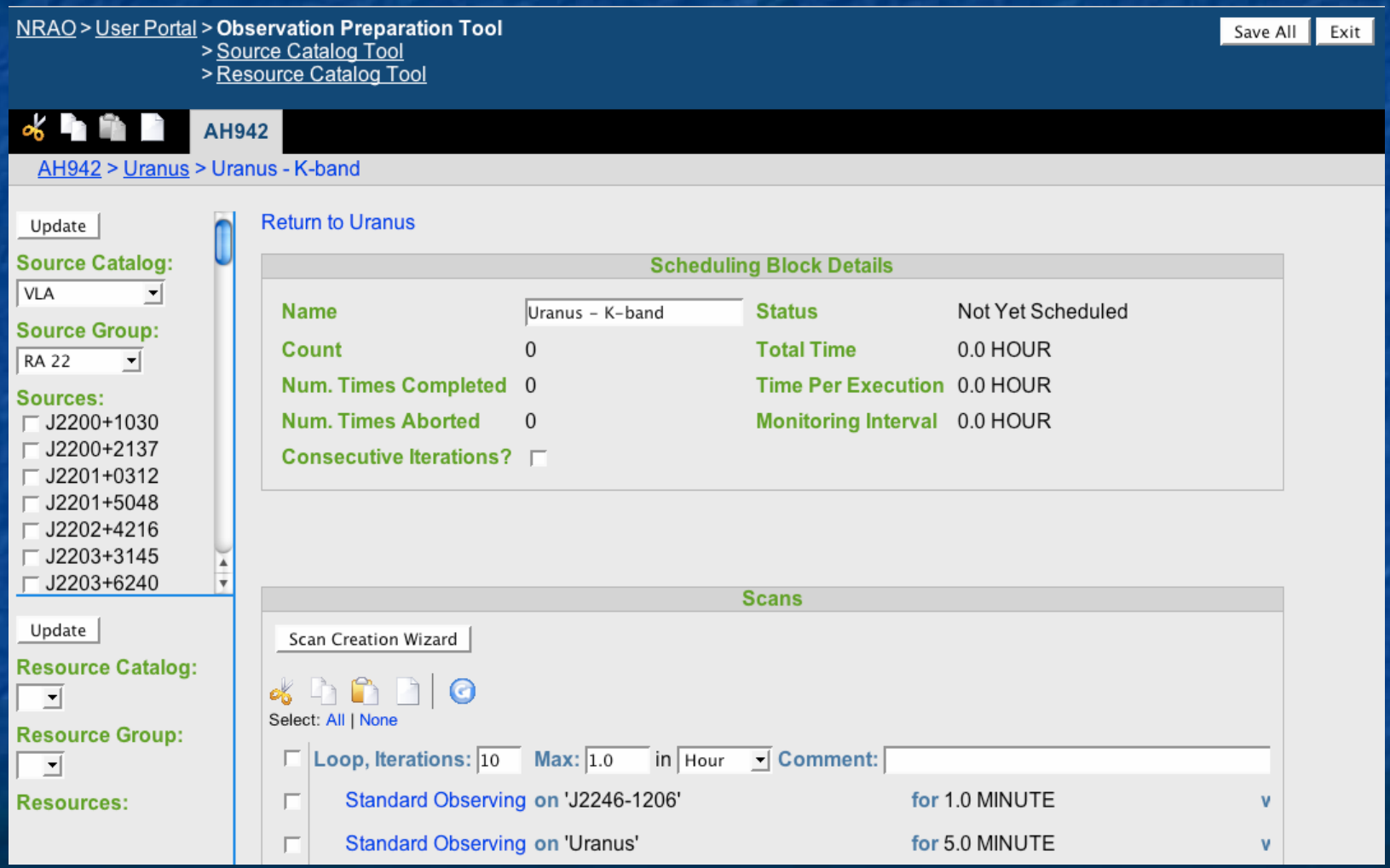


OPT - Components

Modify SB



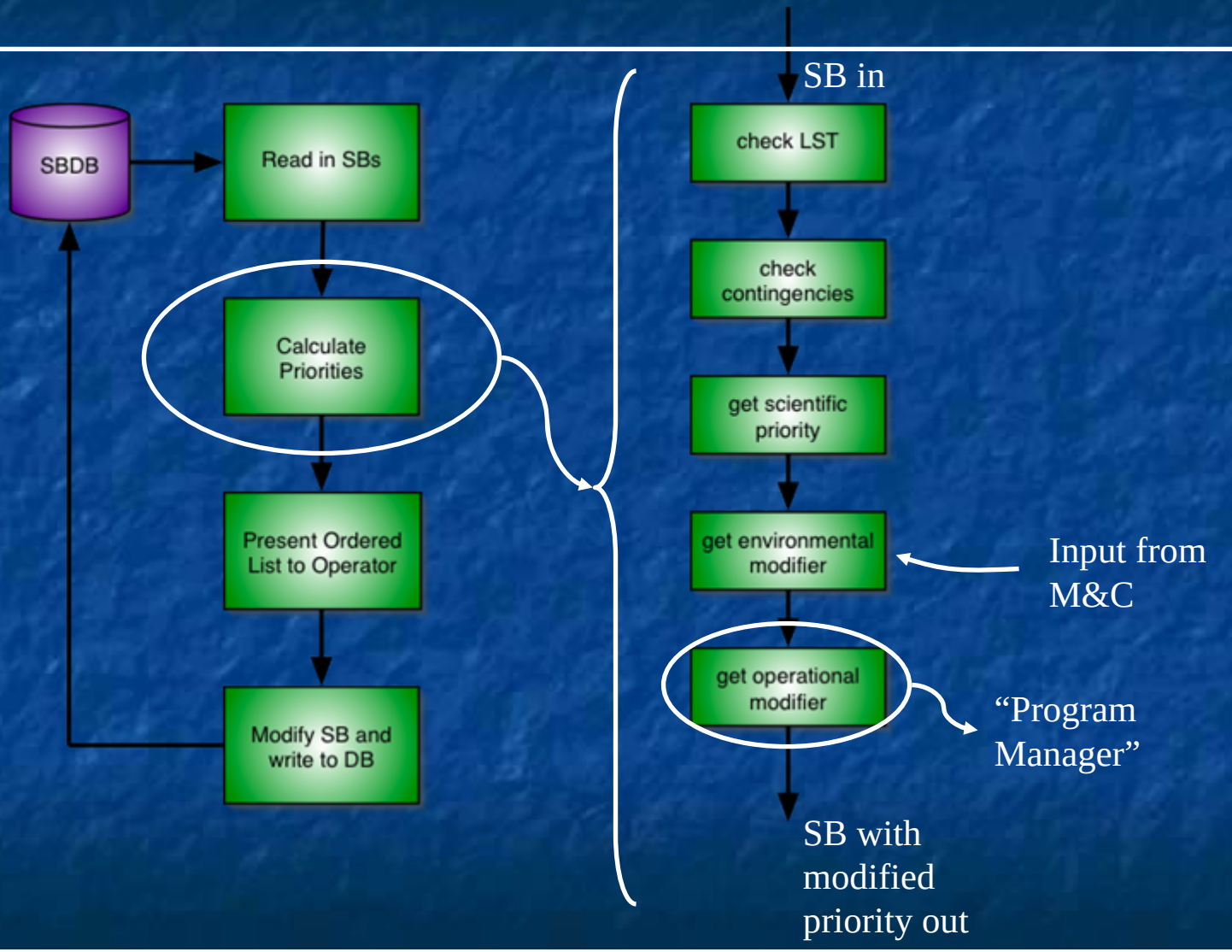
OPT - Demo


NRAO > User Portal > Observation Preparation Tool
> Source Catalog Tool
> Resource Catalog Tool
Save All
Exit
AH942
AH942 > Uranus > Uranus - K-band
Update
Source Catalog:
VLA
Source Group:
RA 22
Sources:
J2200+1030
J2200+2137
J2201+0312
J2201+5048
J2202+4216
J2203+3145
J2203+6240
Update
Resource Catalog:
Resource Group:
Resources:
Return to Uranus
Scheduling Block Details
Name
Uranus - K-band
Status
Not Yet Scheduled
Count
0
Total Time
0.0 HOUR
Num. Times Completed
0
Time Per Execution
0.0 HOUR
Num. Times Aborted
0
Monitoring Interval
0.0 HOUR
Consecutive Iterations?
Scans
Scan Creation Wizard
Select: All | None
Loop, Iterations: 10 Max: 1.0 in Hour Comment:
Standard Observing on 'J2246-1206' for 1.0 MINUTE
Standard Observing on 'Uranus' for 5.0 MINUTE

Observation Scheduling (OST)

- Takes pool of available Scheduling Blocks and chooses what should be observed next on the telescope
- Must take into account scientific priority, current observing conditions, and other priority modifiers (project completion pressure, for example)
- Must be able to run autonomously, eventually

OST - Components



OST - Tests on VLA

- Prototype system tested on the VLA – in current regular use (ancestor used successfully for VLBA for several years)
- Observers send in modified OBSERVE files (extra “header” information included in comments at the top)
- OBSERVE files wrangled by NRAO staff
- Prototype OST system presents operator with prioritized list of what to observe next
- All command line tools
- Providing us with invaluable information on the practical aspects of dynamic scheduling of a many-element radio interferometer

OST VLA Tests - Lessons Learned

- It works! Fundamentally, the VLA can be dynamically scheduled, with Scheduling Blocks drawn from a pool and subsequently observed.
- The system is inordinately fond of short SBs - it works well for them, but medium to long length SBs (>~ 2 hours) have not been well tested.
- Popular LSTs are efficiently used - those LSTs that are not so oversubscribed are not so efficiently used.
- Currently effort-intensive (but getting better)

OST – new GUI tool

- New tool which fits in to the HLA was developed during late 2006 to mid 2007
- GUI – much easier to use than old CLI
- Provides framework for testing many different heuristic schemes
- Intent was to deploy for testing at VLA summer 2007, but primary developer has left NRAO, slowing this down (replacement employee starts Sept. 10)

OST – new GUI tool