Moving Object Pipeline System (MOPS)
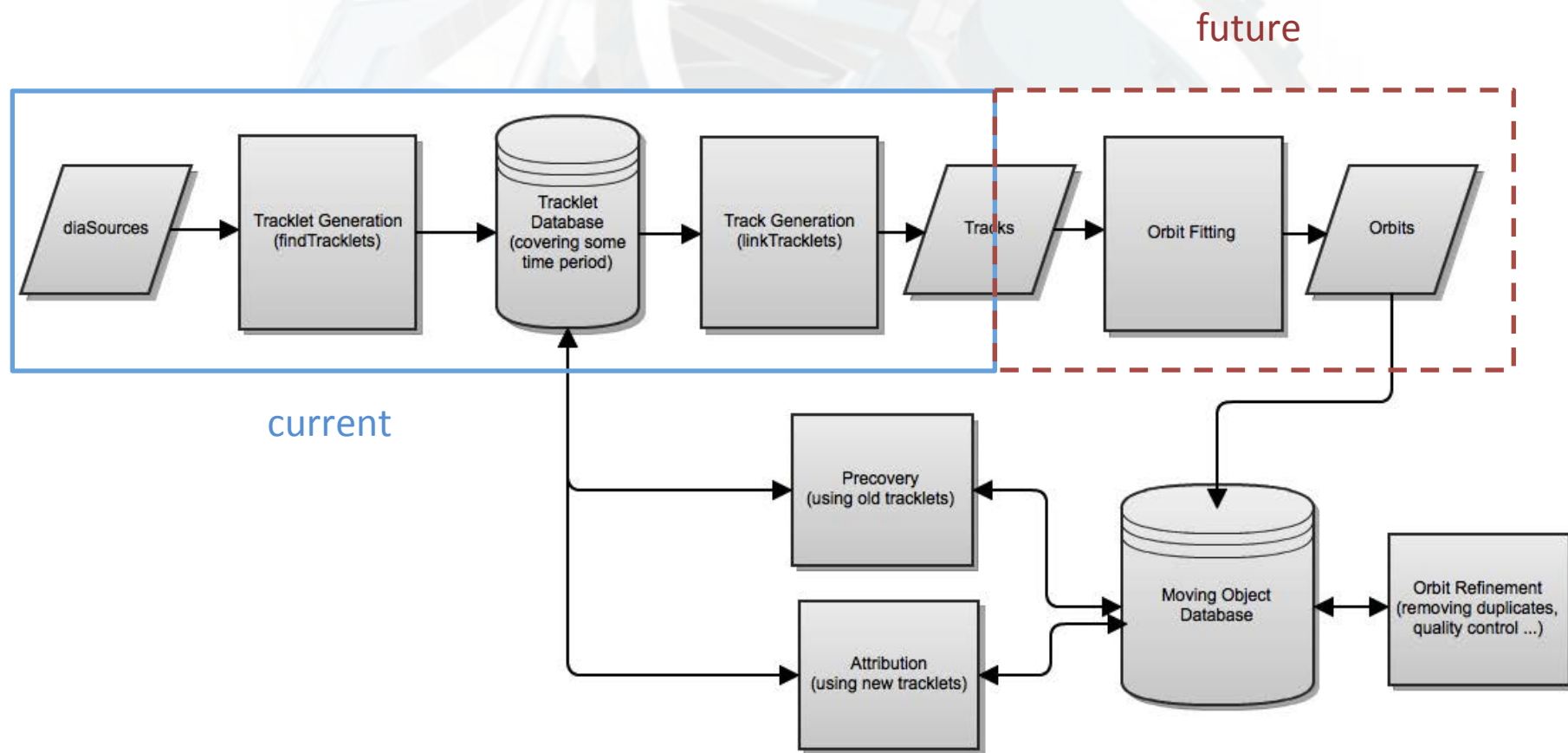
LDM-156

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Basics

- Installs on Linux and Mac OSX
- On [github](#) (lsst/mops_daymops)
  - Requires gsl, eigen, boost
  - Currently uses SLALIB
    - Experimental branch uses PAL instead
- Latest updates and commits:
  - [neosim](#) (scripts/experimentation)
  - [fork](#) (updates/fixes)

In Context

findTracklets

Links two DiaSource detections occurring within one night into a ***tracklet,***
assumes linear motion

Random Selection: 800 objects, 9 nights
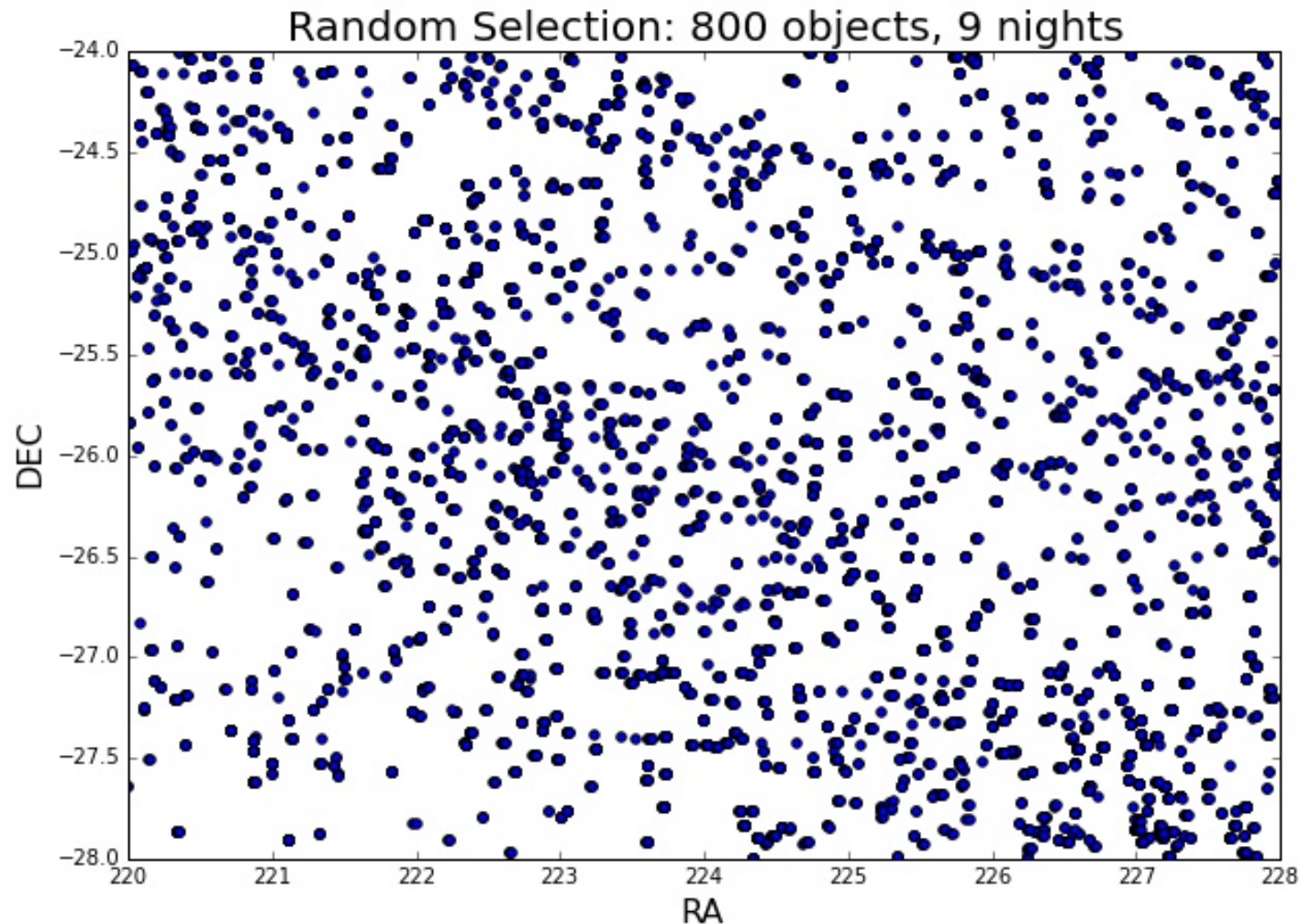
findTracklets – collapseTracklets – purifyTracklets – removeSubsets – linkTracklets

findTracklets

Links two DiaSource detections occurring within one night into a *tracklet,*
assumes linear motion

Random Selection: 800 objects, 9 nights

Tracklets: 14342
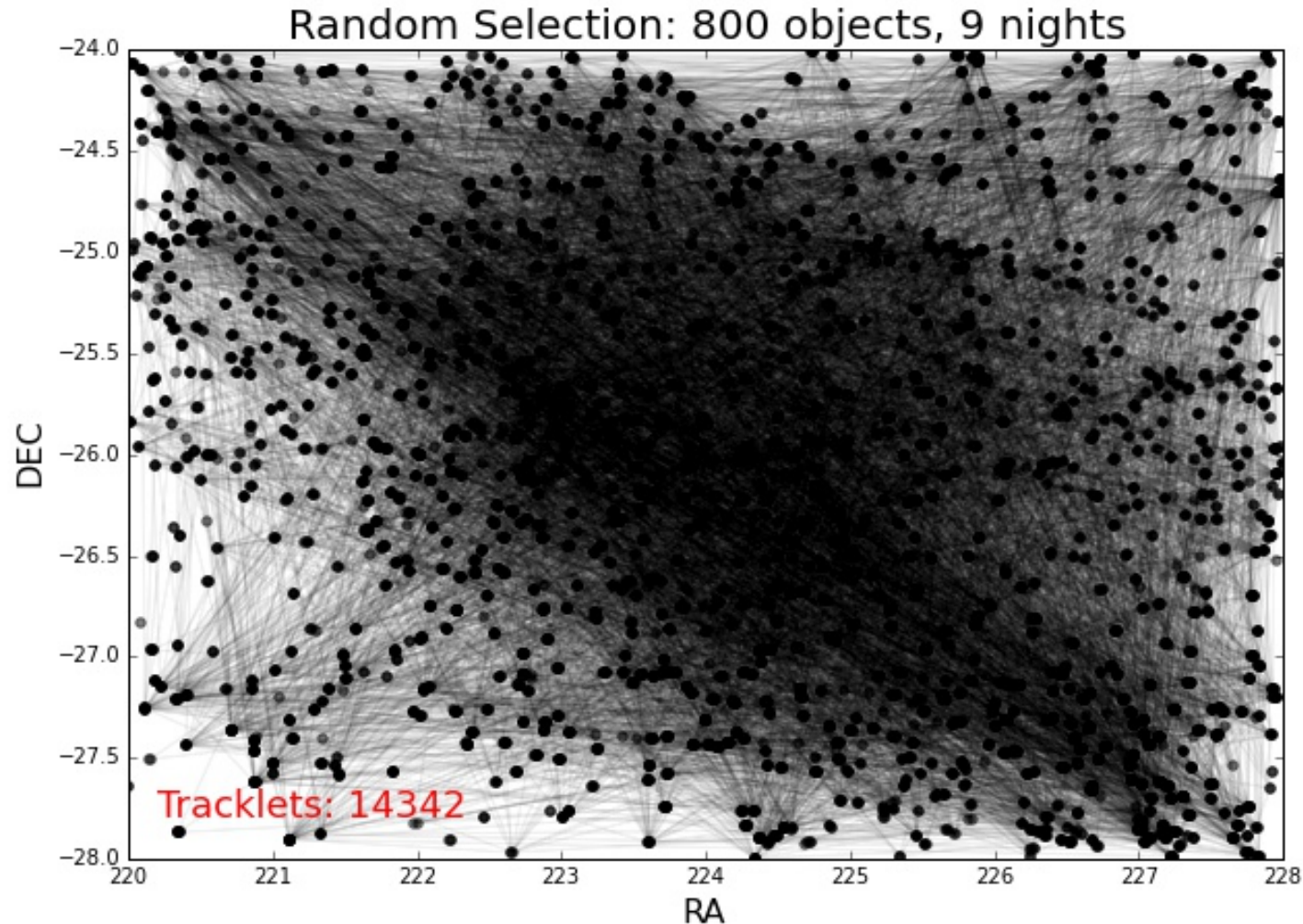
findTracklets – collapseTracklets – purifyTracklets – removeSubsets – linkTracklets

collapseTracklets

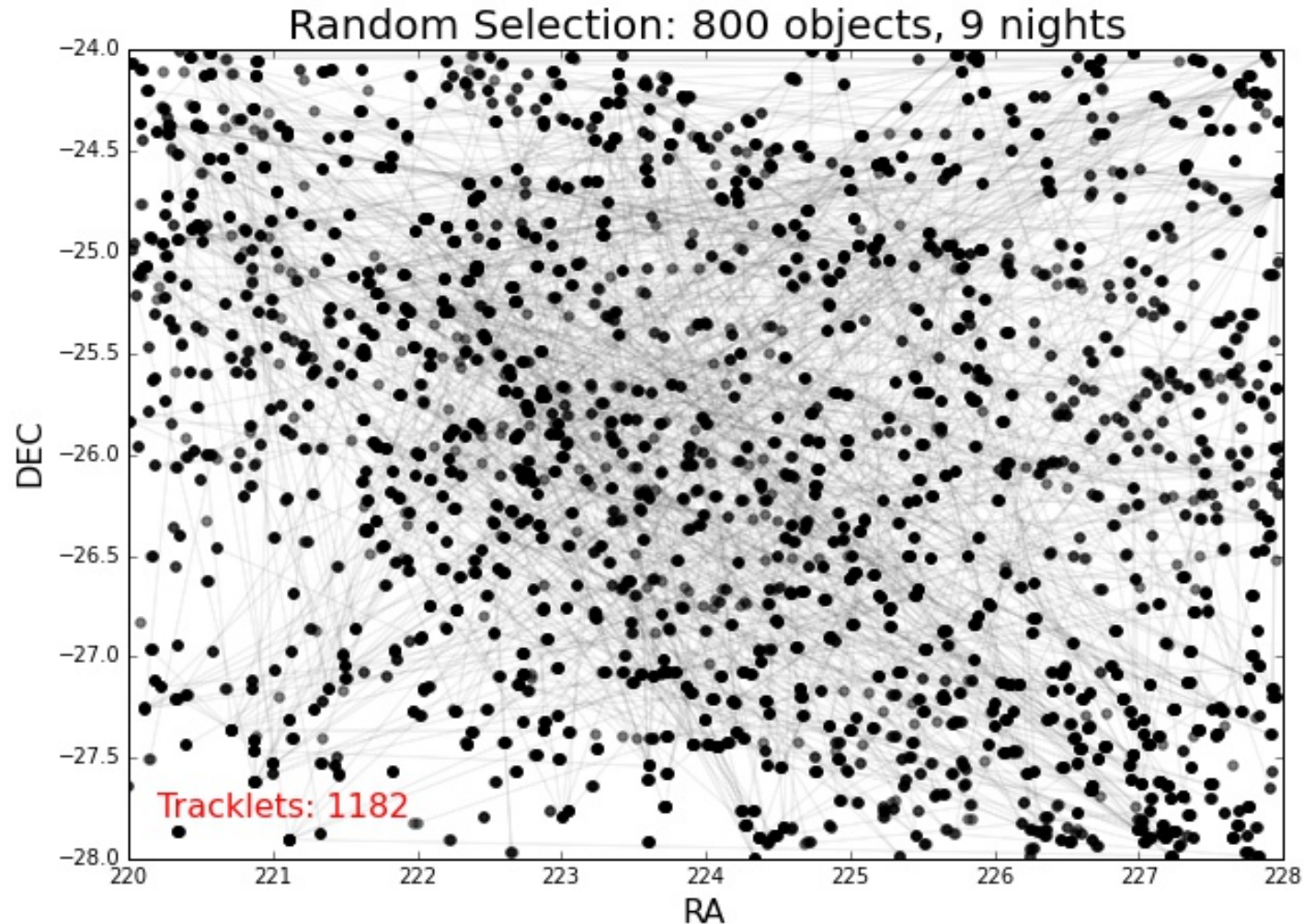Merges collinear **tracklets**

Random Selection: 800 objects, 9 nights
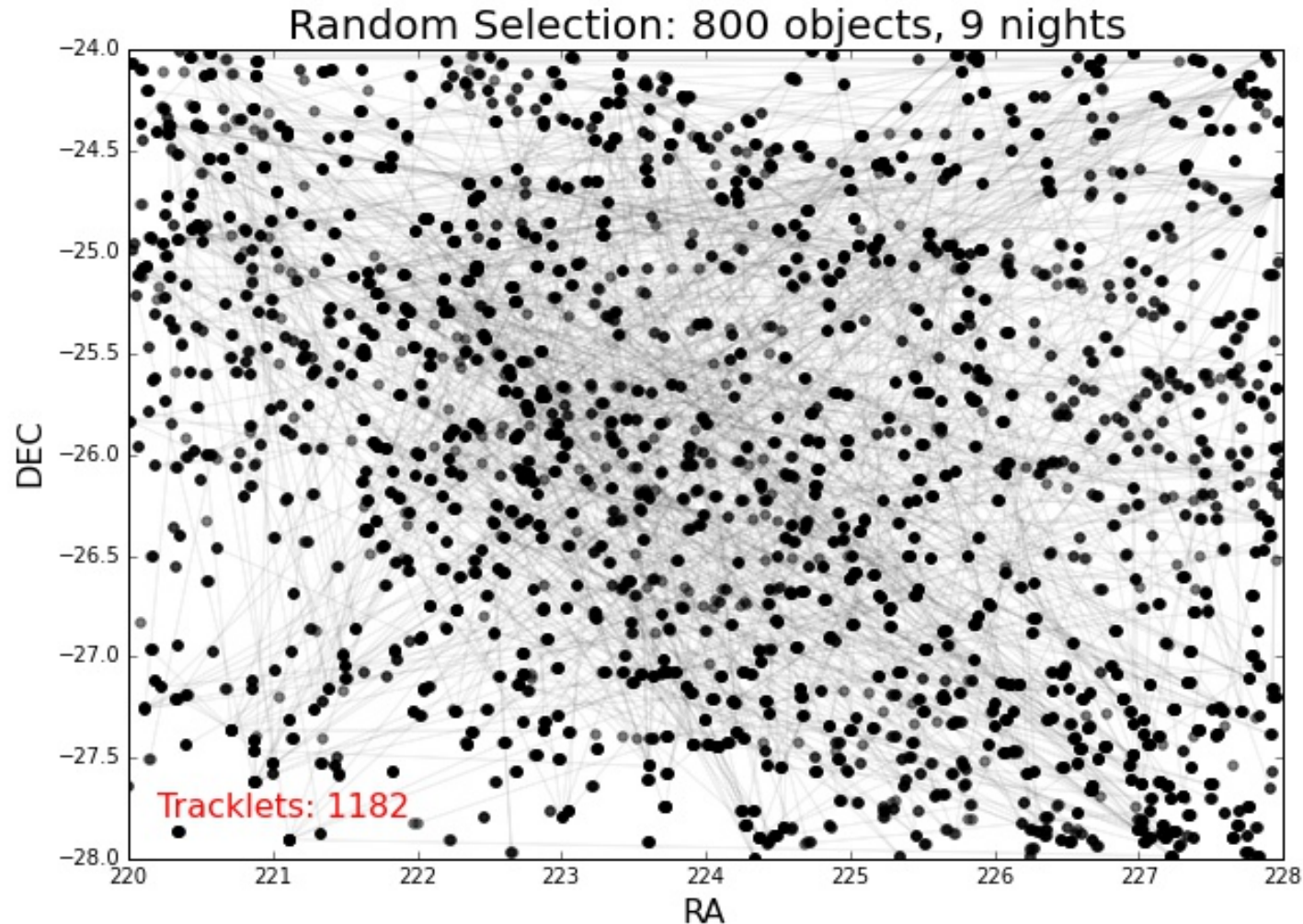
Tracklets: 1182

findTracklets – **collapseTracklets** – purifyTracklets – removeSubsets – linkTracklets

purifyTracklets

Removes detections from merged **tracklets** if they are sufficiently far away from the best-fit line

Random Selection: 800 objects, 9 nights

Tracklets: 1182

findTracklets – collapseTracklets – **purifyTracklets** – removeSubsets – linkTracklets

removeSubsets

Removes **tracklets** that are subsets of longer **tracklets**

Random Selection: 800 objects, 9 nights
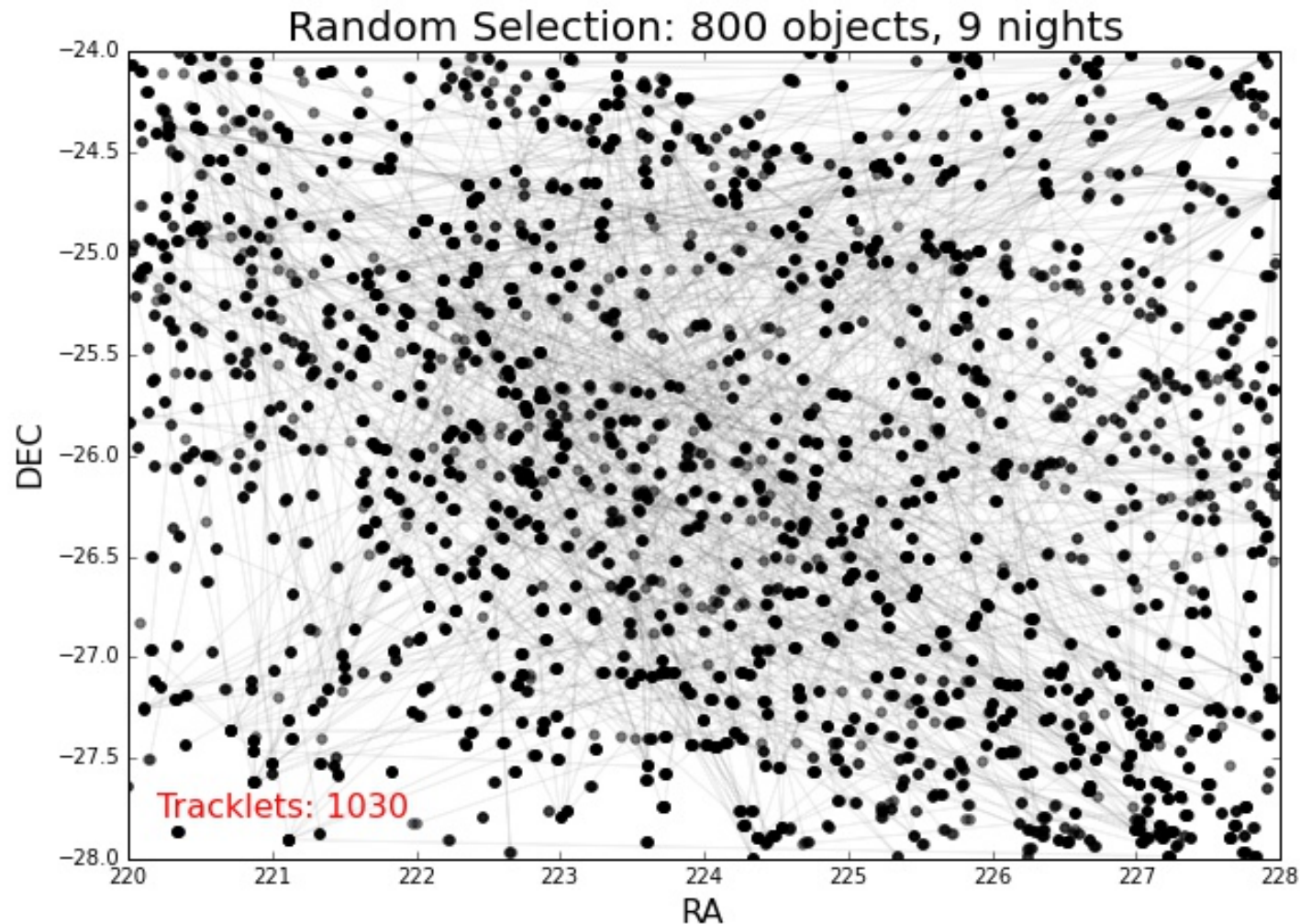
Tracklets: 1030

findTracklets – collapseTracklets – purifyTracklets – **removeSubsets** – linkTracklets

linkTracklets

Links **tracklets** into **tracks**, *assumes quadratic fit*

Random Selection: 800 objects, 9 nights

Tracks: 159
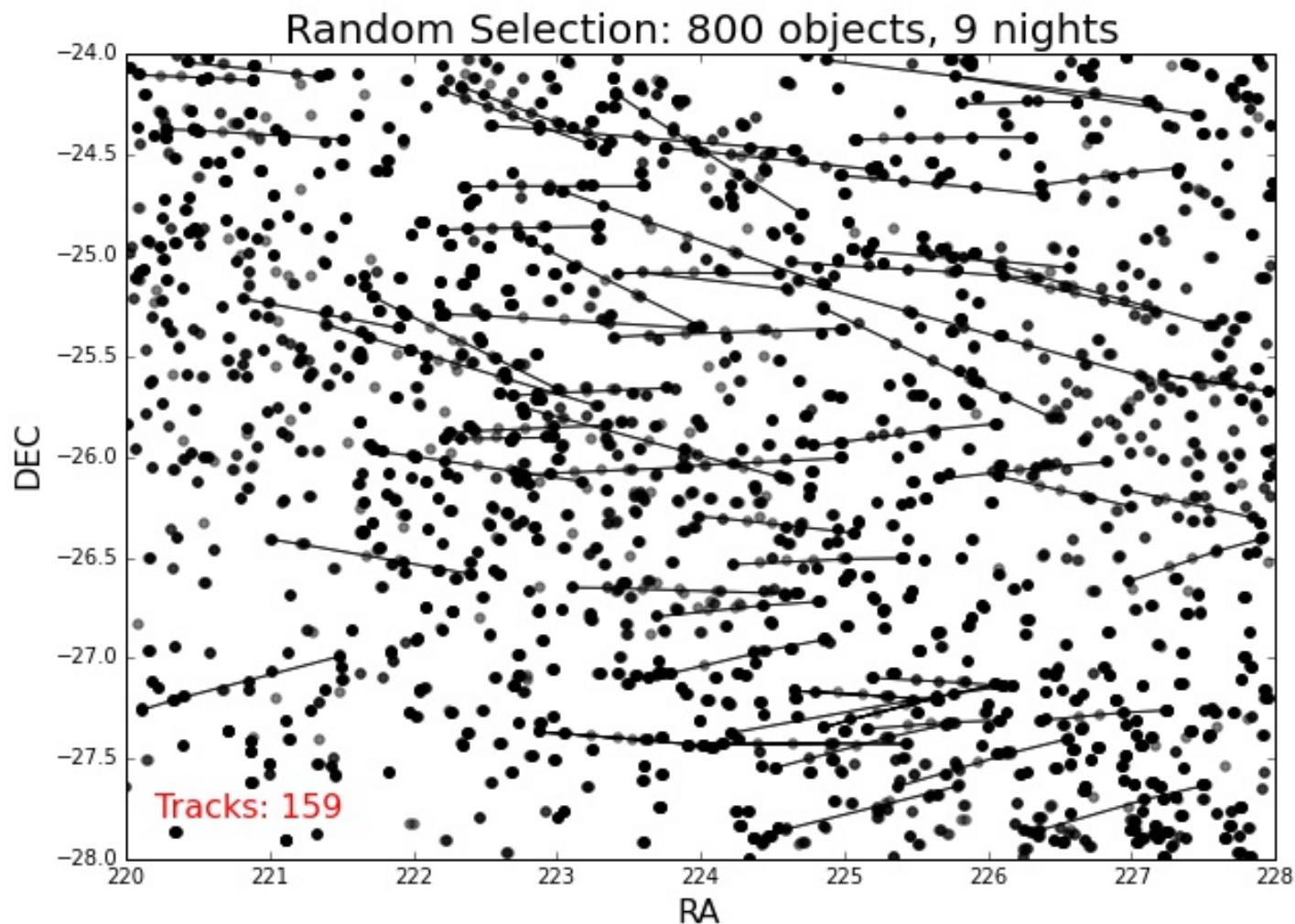
findTracklets – collapseTracklets – purifyTracklets – removeSubsets – linkTracklets

Status

- Run script
  - Accepts config file
  - Command line parameter specification with accepted defaults
  - Uses tracker and parameter object
- Unittest
- Experimental PAL branch
  - Compiles on Linux and Mac
  - Error: fails unittest
- Tested up to linkTracklets
  - Error: has trouble moving data in 180 degree range despite no complaints from collapse, purifyTracklets

Future

- Fix errors/bugs

- Make function inputs consistent

- Run failure tests

- Run efficiency tests
  - Understand scaling with larger datasets

- Add orbit determination

- Plotting and visualization tools

- Analysis tools