

Cornell University



# Imaging Mission Database

[plandb.sioslab.com](http://plandb.sioslab.com)



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for the Macintosh SIT

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Roman Coronagraph Info Sessions  
Day 2. 10/28/2021



## Why Another Database?

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- Existing resources do a great job of tabulating known exoplanet data
  - <https://exoplanetarchive.ipac.caltech.edu/>
  - <http://exoplanet.eu/catalog/>
- However, they are not geared towards imaging missions, and lack key data needed for planning imaging observations
- We seek to augment existing catalogs, **not** replace them
  - Also we wanted something we can more easily query

# Just Because You Know Something is There...



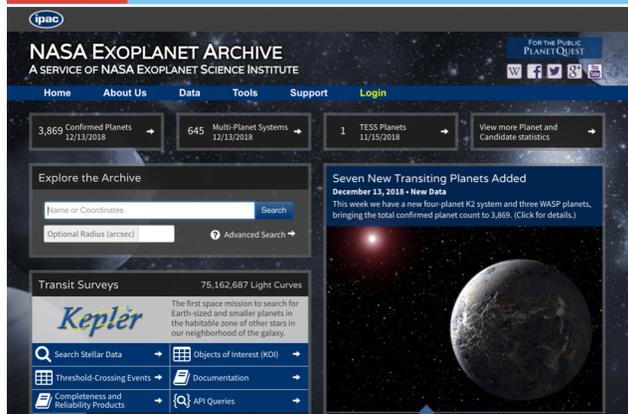
...Doesn't mean  
you'll see it

Most of the currently  
known best CGI  
targets are RV  
detections, meaning  
that we lack:

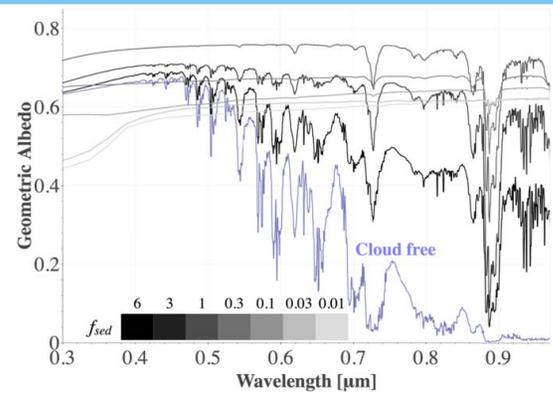
- Inclination
- Photometry



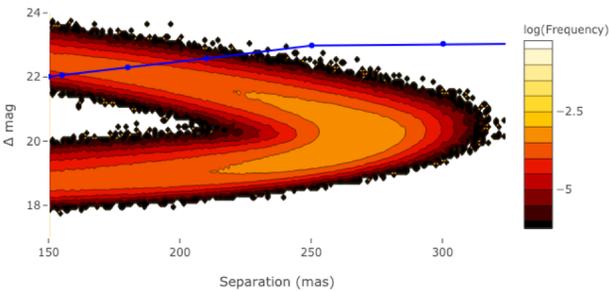
# What We Do



Pick best orbital fits  
Calculate Additional Properties



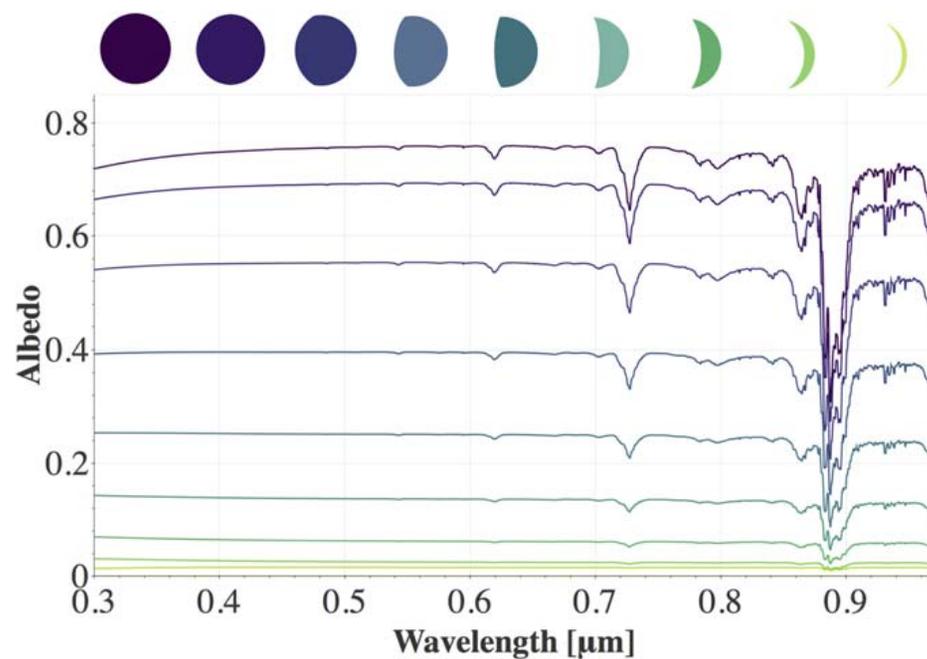
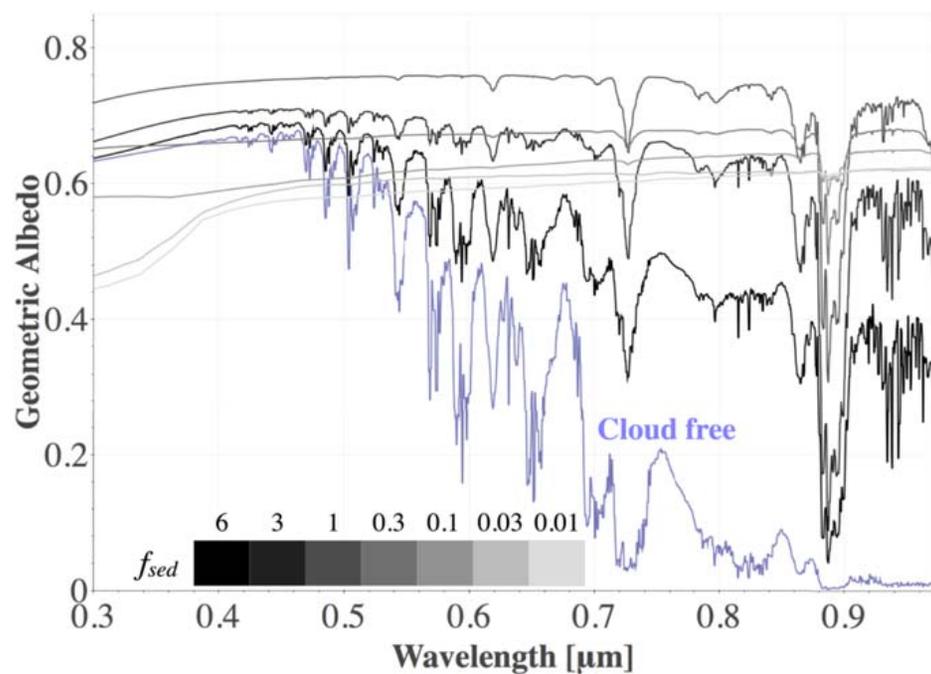
Photometric Models



Detection Probabilities

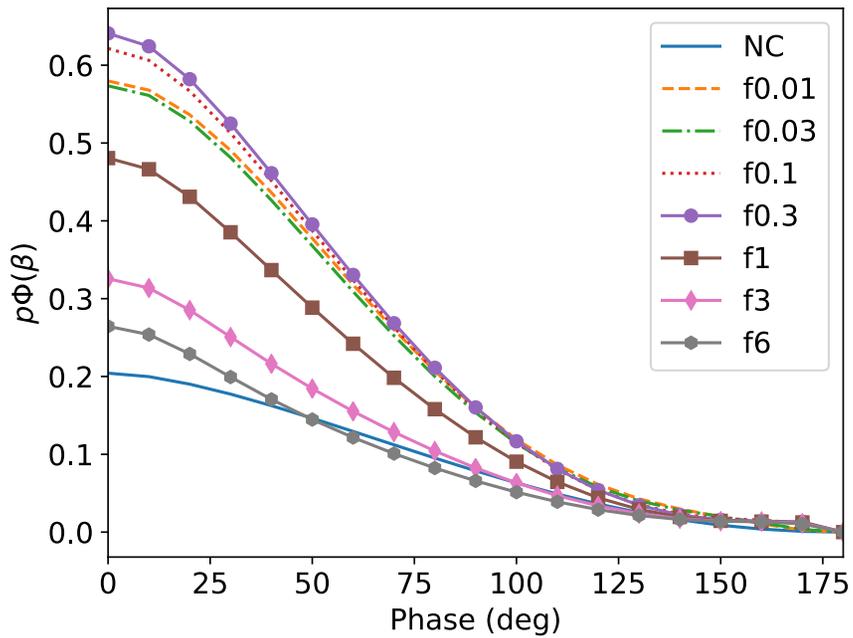


# Photometric Model

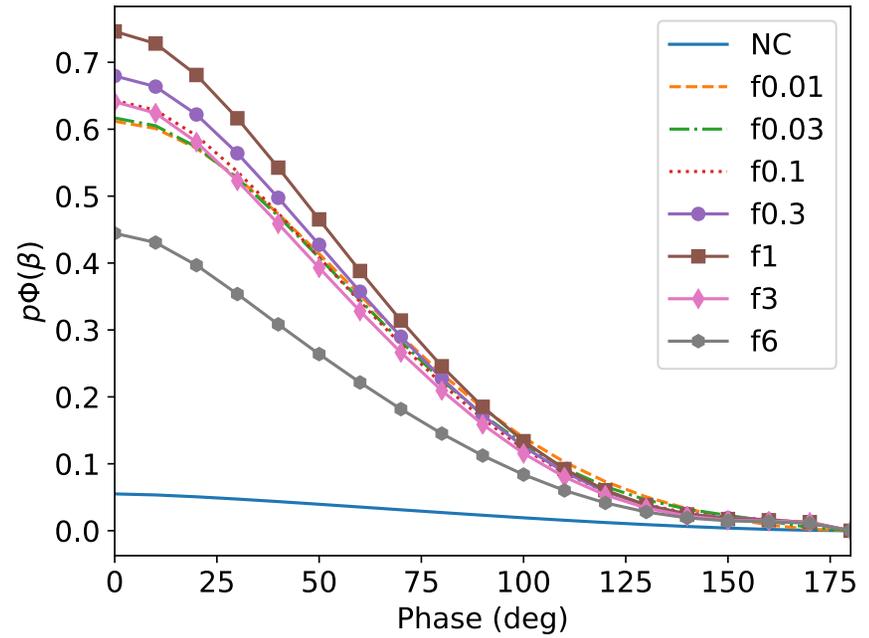




# Clouds Make a *Huge* Difference



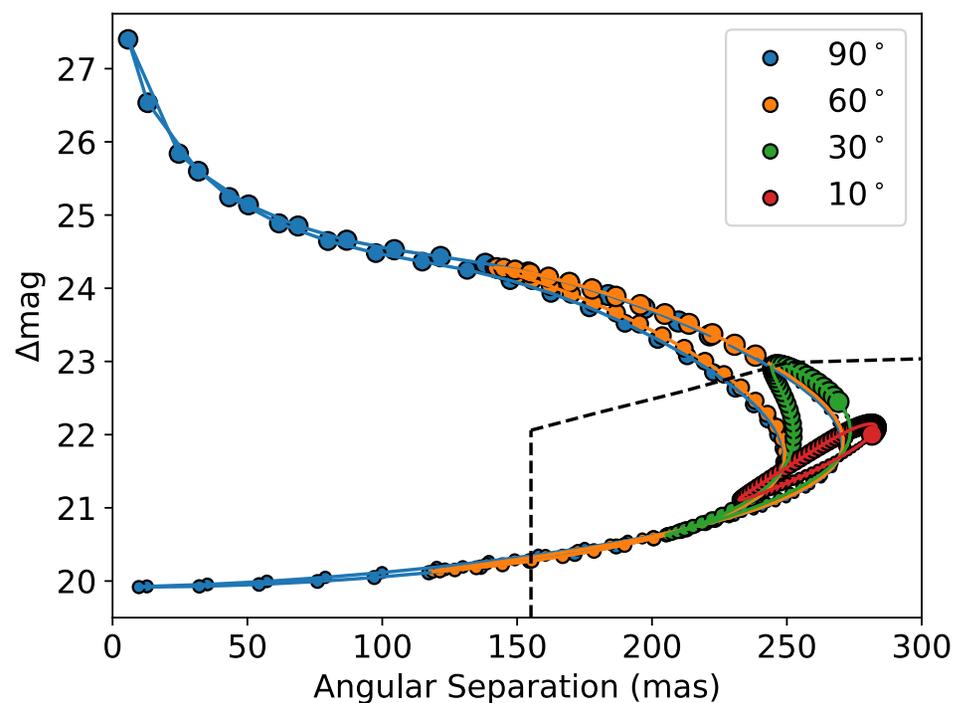
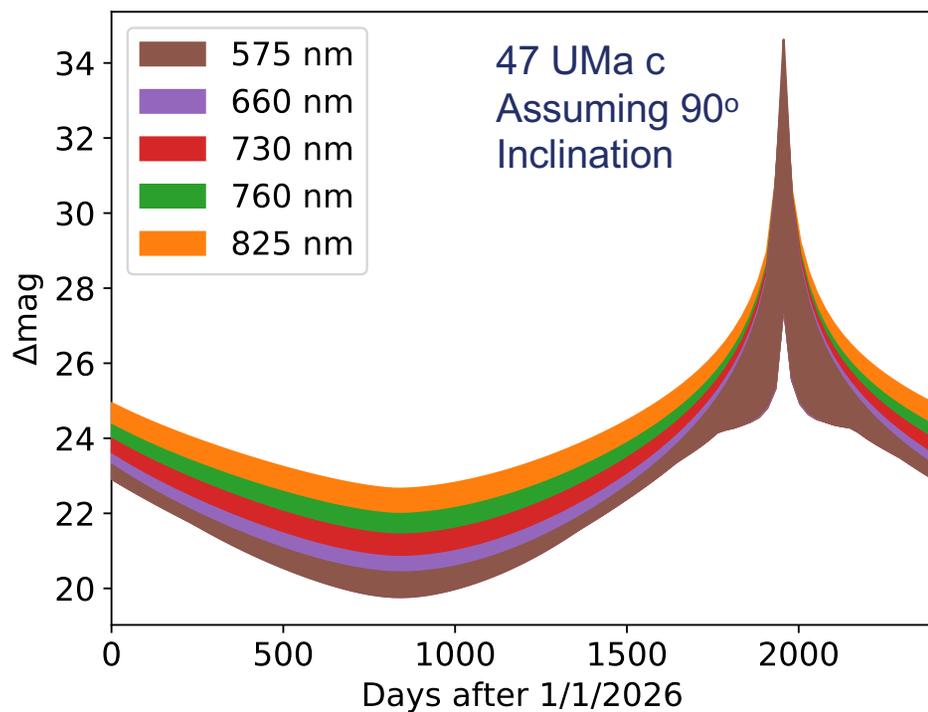
1 AU at 575 nm



5 AU at 825 nm

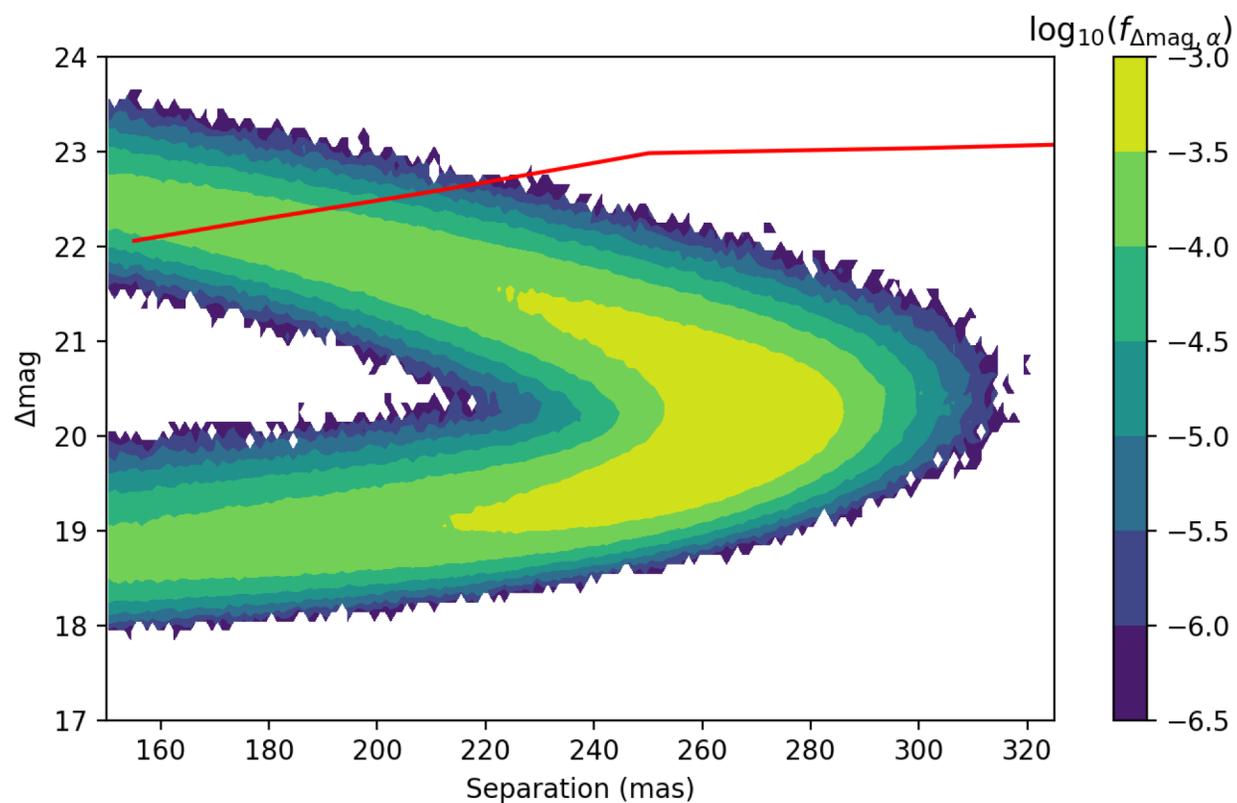


# Current Capabilities: Orbits & Photometry





# Current Capabilities: Probability of Detection





# Other Current Capabilities

## General Query

This interface provides direct querying to the full database. Queries including selection of pl\_name will automatically create links to known planet detail pages. See the [Schema](#) for all available tables and columns.

```
select pl_name, pl_angsep, completeness, pl_minangsep, pl_maxangsep, pl_radj, pl_bmassj, pl_orbsmax from  
KnownPlanets where completeness > 0 order by completeness DESC
```

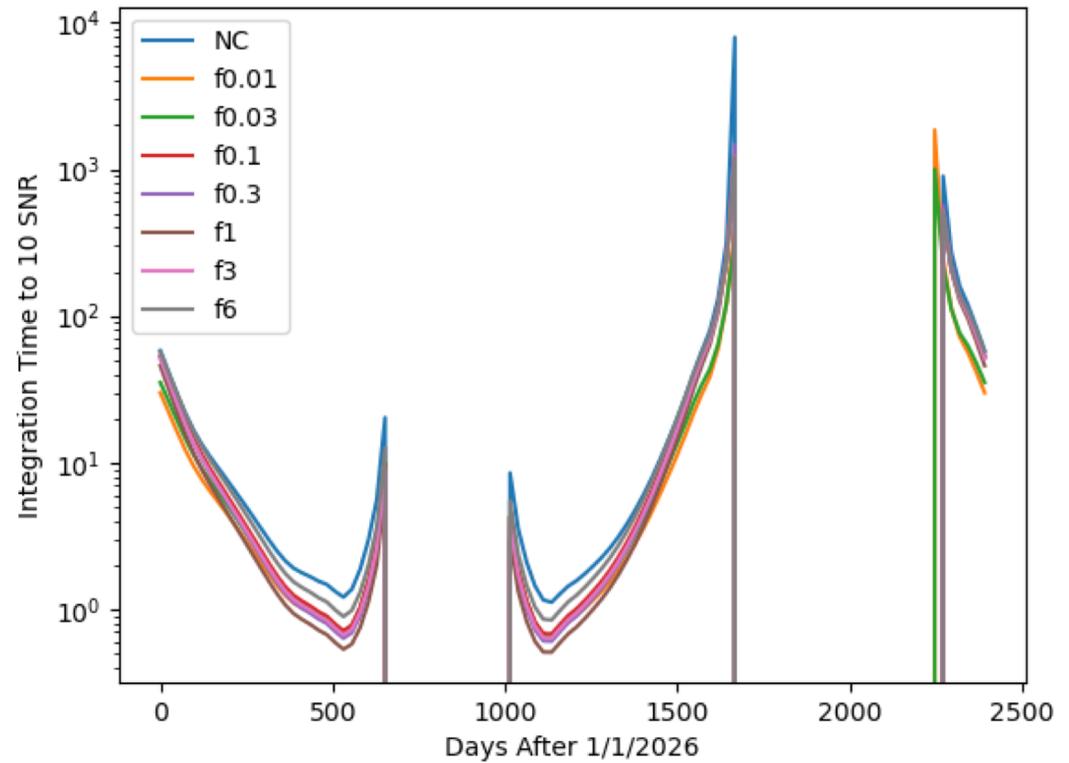
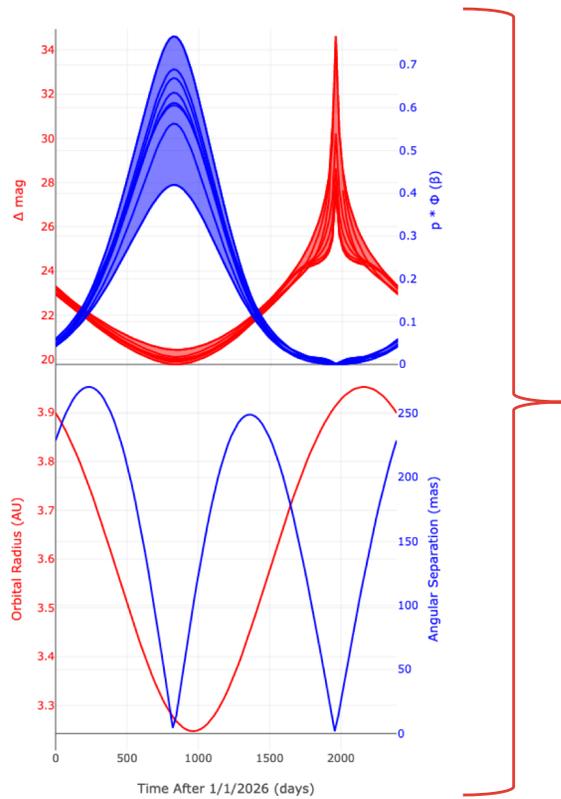
Submit

Save to CSV

- Static Depth of Search Plots for top 120 Targets
- Complete documentation  
(<https://plandb.sioslab.com/docs/html/index.html>)
- Ability to generate your own version and run locally  
(<https://plandb.sioslab.com/docs/html/index.html#building-your-own>)

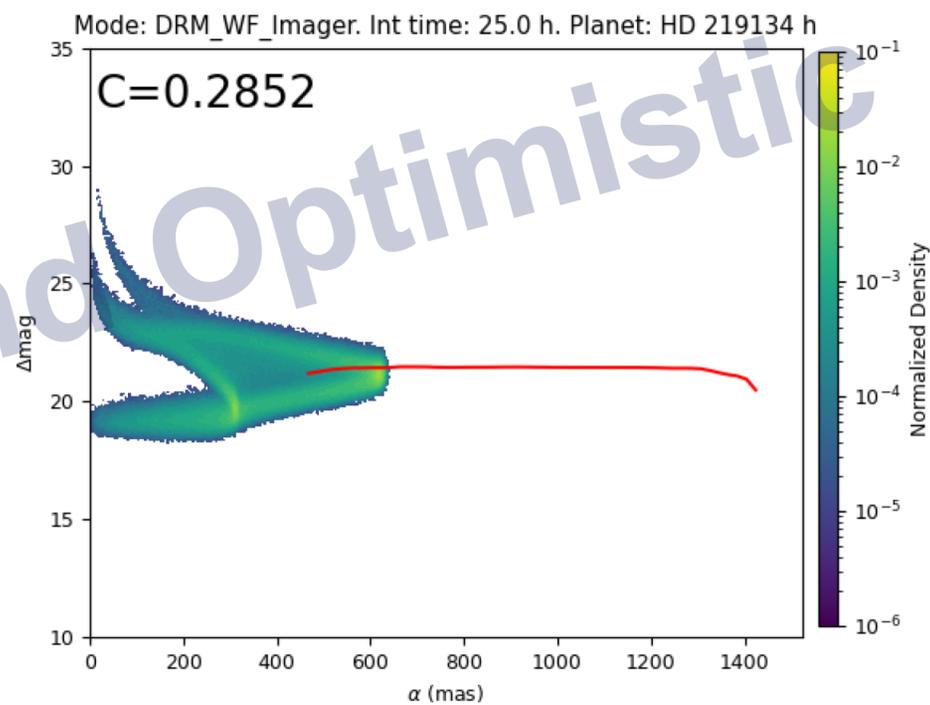
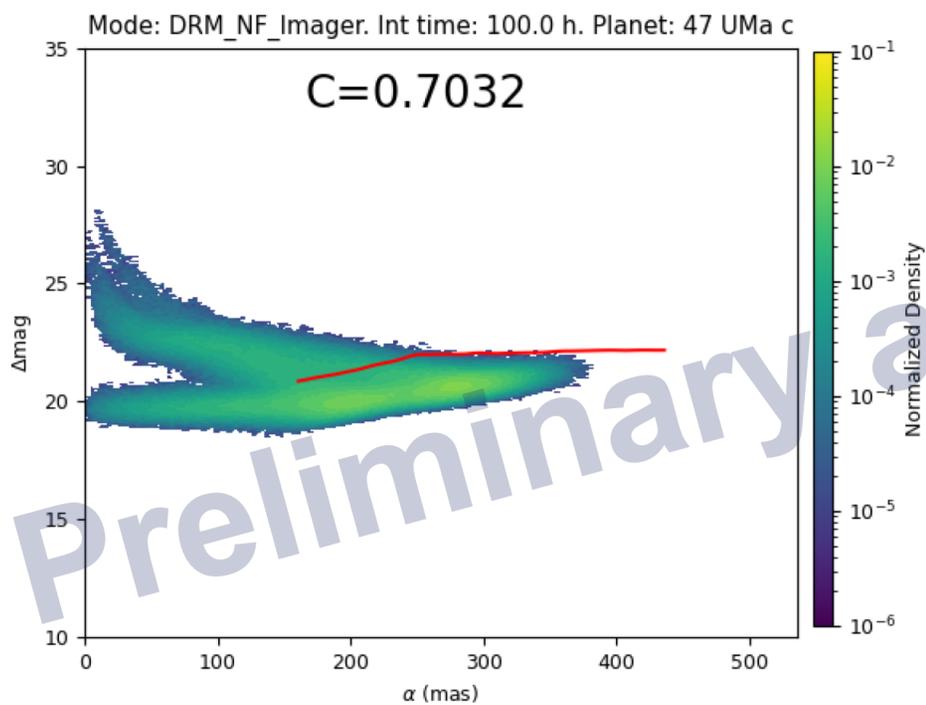


# Coming Soon: Integration Times

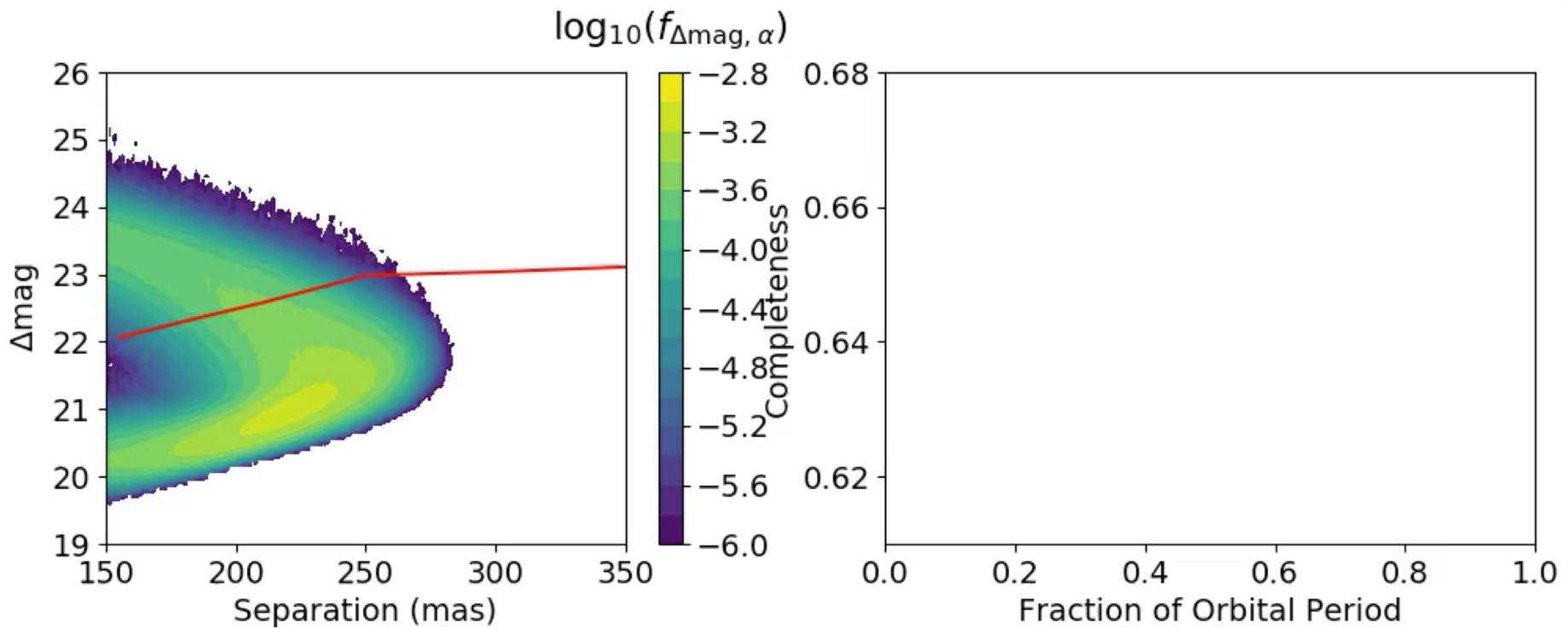




# Coming Soon: Per-Star Detection Limits



# Coming Soonish: Time-Dependent Probabilities





## Summing Up

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- The Imaging Mission Database is intended to be a community resource. It is fully open source (MIT License) and may be replicated by anyone and adapted for any instrument:
  - <https://github.com/sioslab/plandb.sioslab.com>
- Or just use it: <https://plandb.sioslab.com/>
  - If you do, please check out our use policy and requested acknowledgements: <https://plandb.sioslab.com/about.php>
- The database includes content from the NASA Exoplanet Archive, which is operated by the California Institute of Technology, under contract with the National Aeronautics and Space Administration under the Exoplanet Exploration Program, and from the SIMBAD database, operated at CDS, Strasbourg, France.