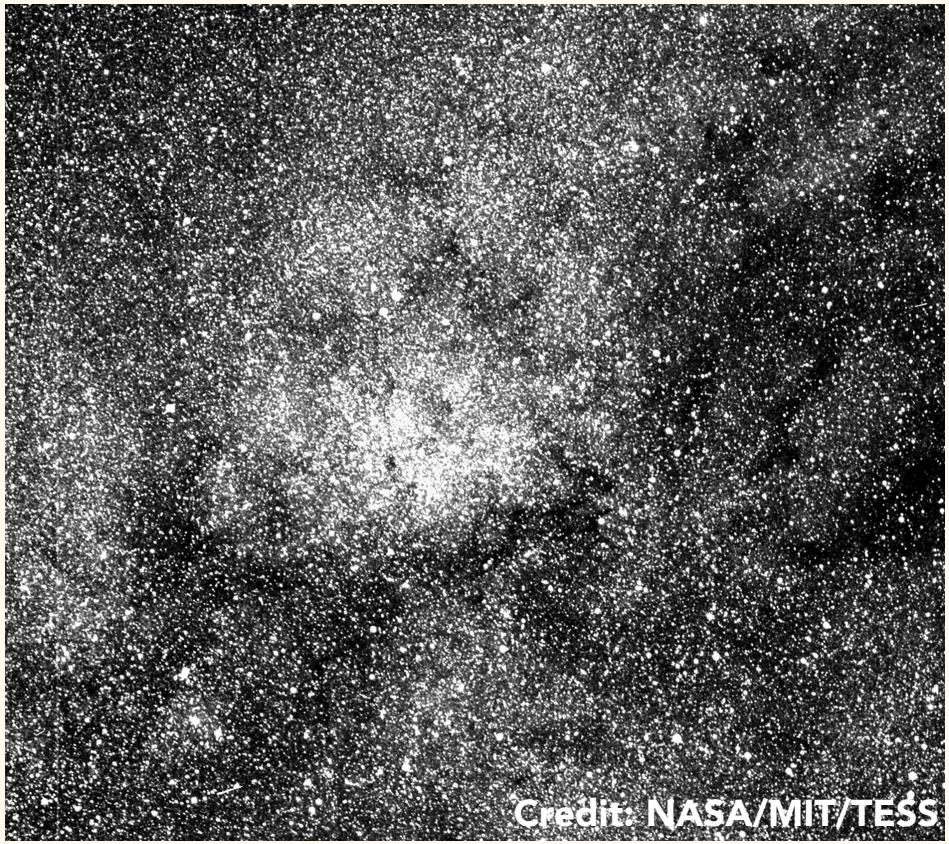
Currently Known Exoplanets in this Era of New TESS Discoveries

Paul Dalba (BU→UCR)
Stephen Kane (UCR)



ExSoCal IV, 17 Sep 2018
NExScI-Caltech

@Paul_Dalba

A Transit Marks the Spot of Hidden TESS Treasure in Known Exoplanet Systems

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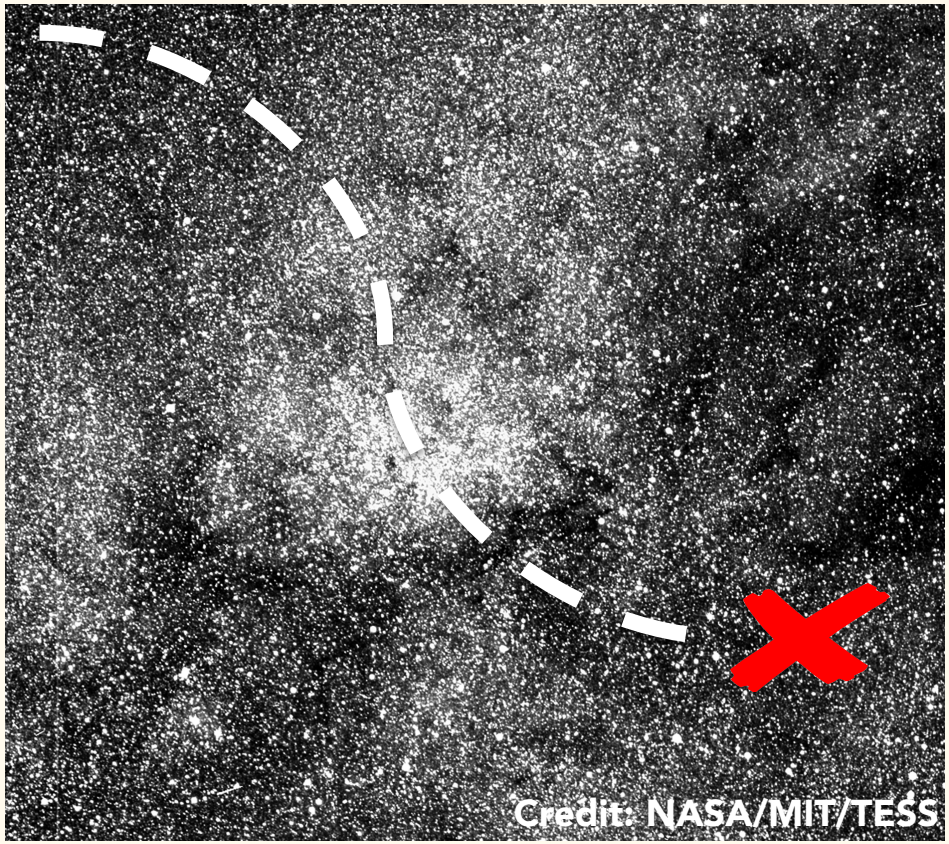

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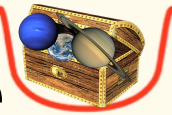
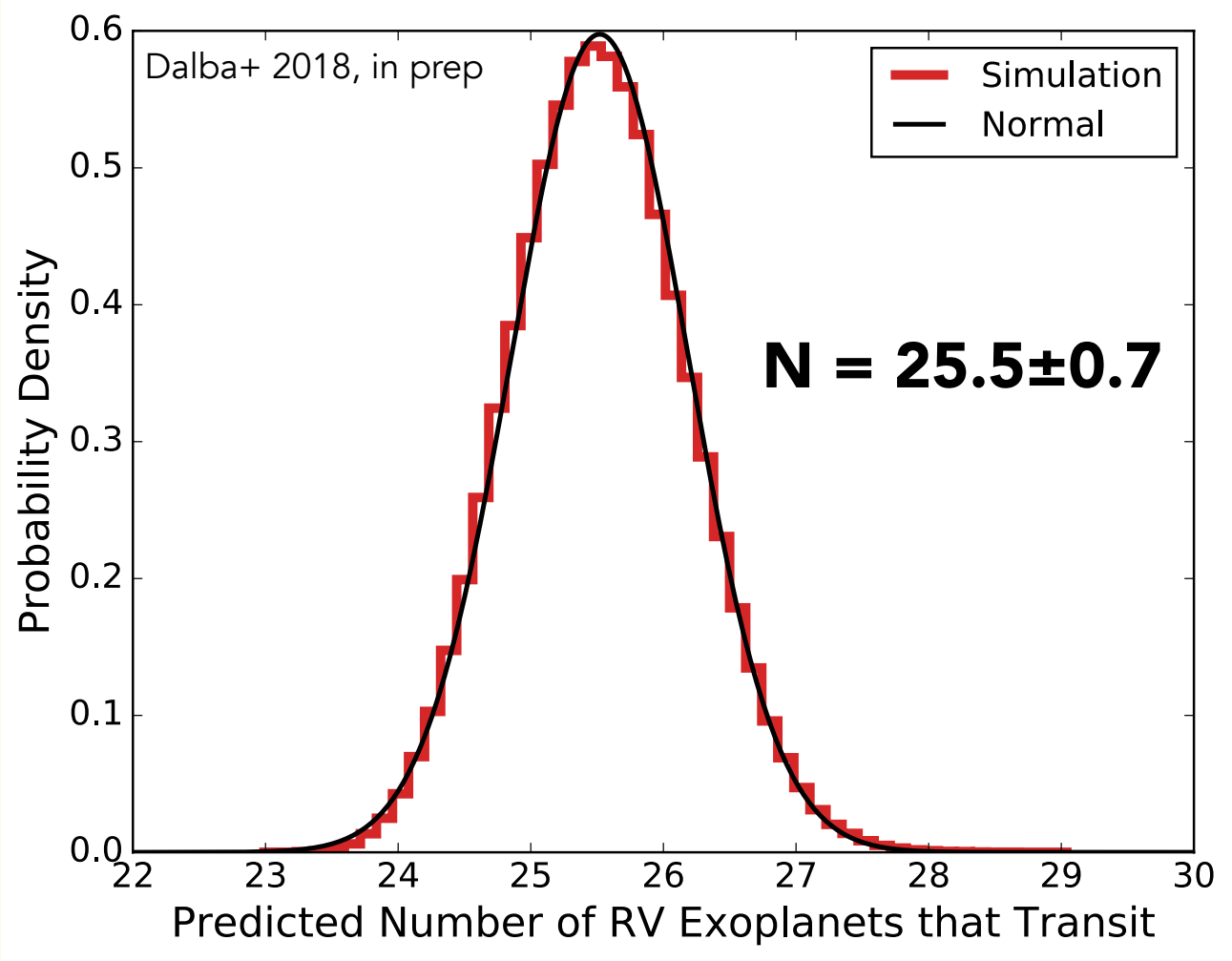
Known RV Exoplanets arrrr a Treasure Trove of *TESS* Early Science!

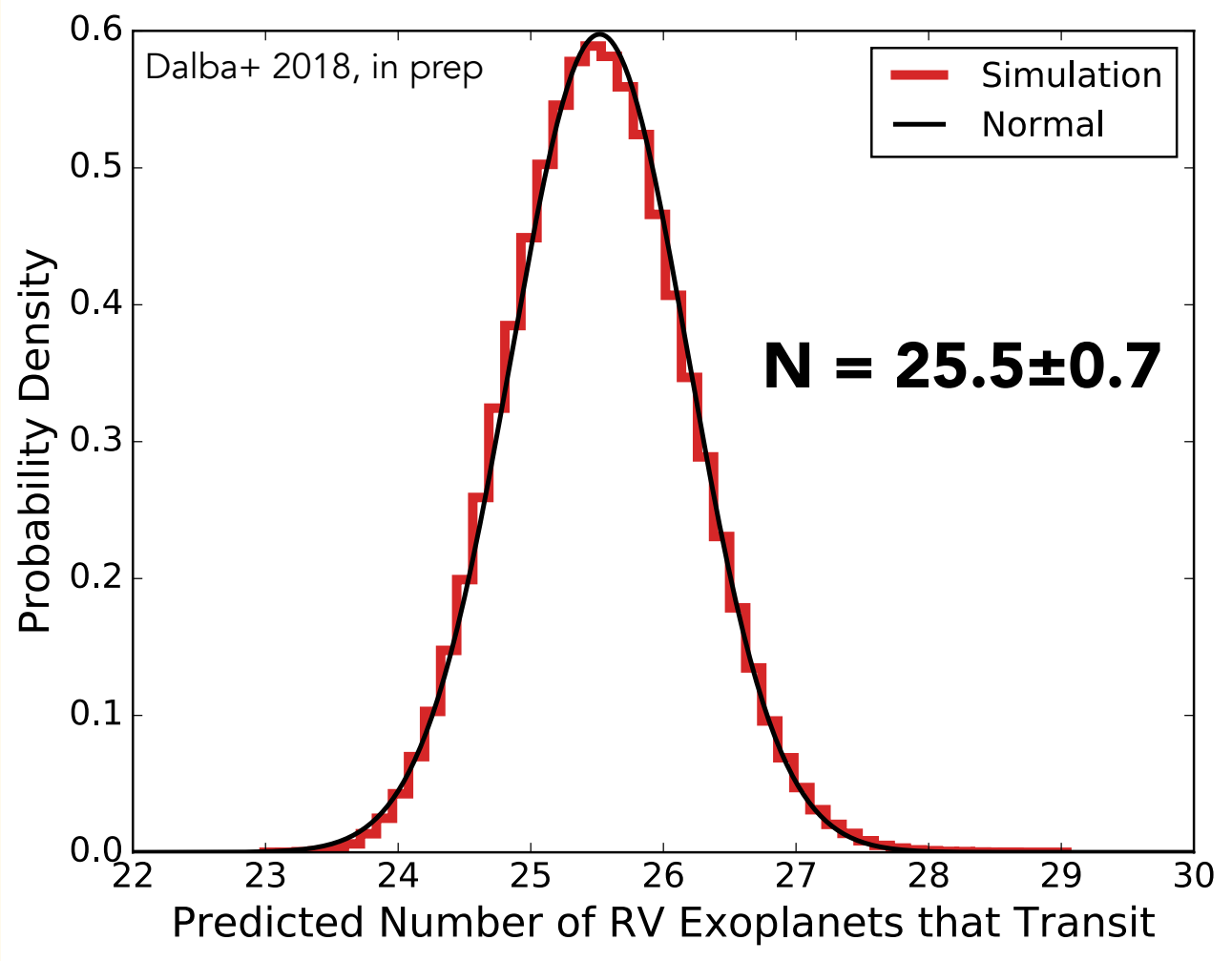


- Over 670 **RV** exoplanets spread across the sky
- Photometric follow-up resources (ground or space) are limited!
- How many are transiting, and how many will *TESS* observe (or rule out)?

How many RV exoplanets transit?

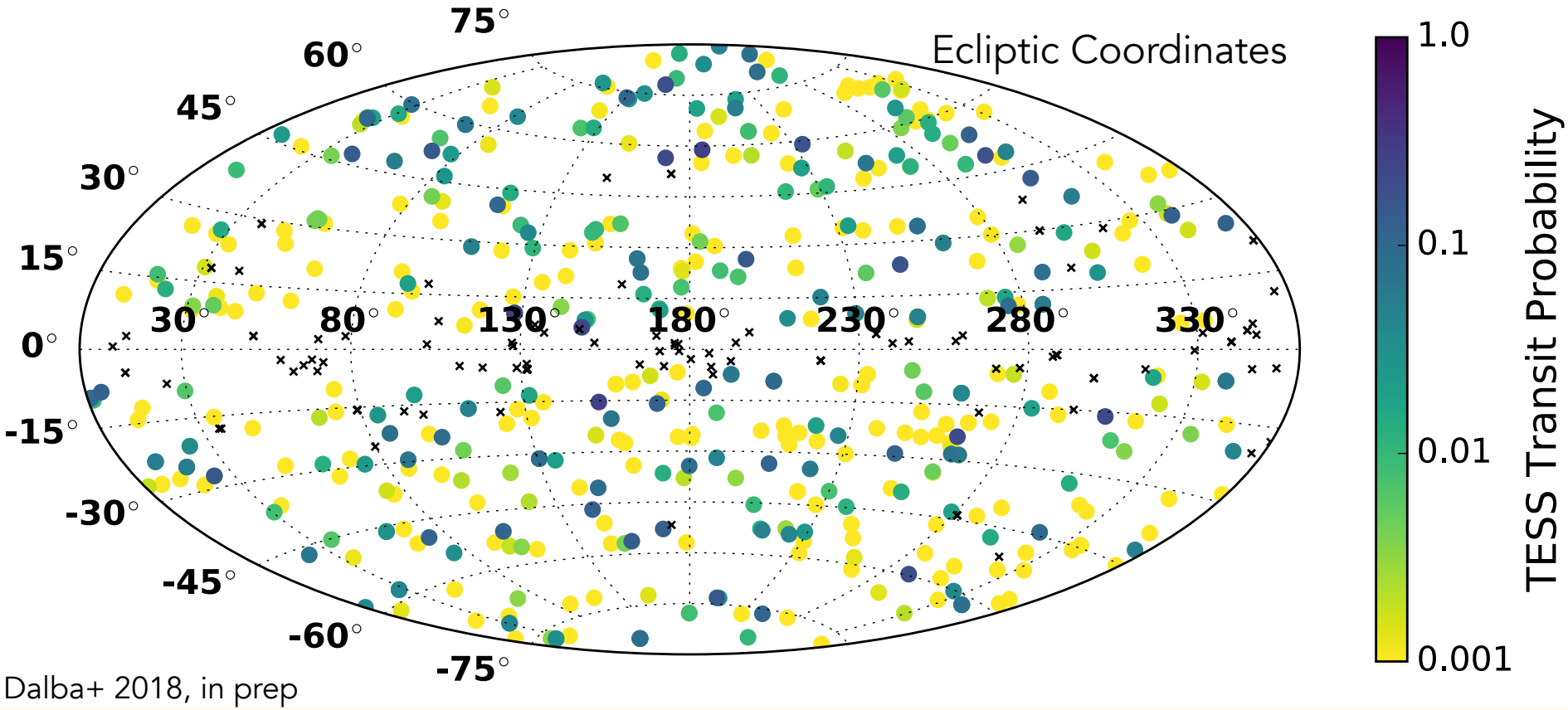


How many RV exoplanets transit?



Only 12 RV exoplanets are currently known to transit!

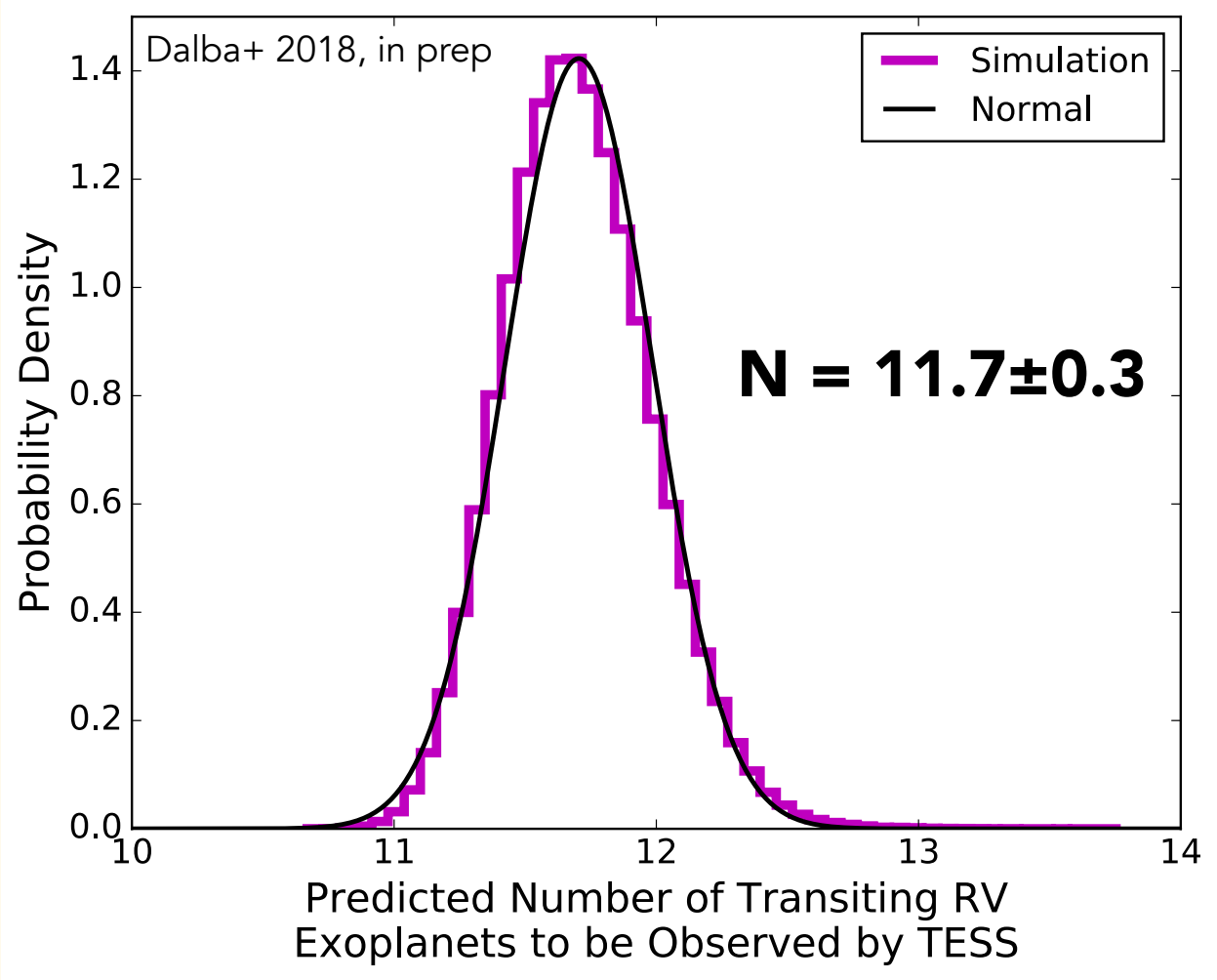
Where be these hidden transits?



Dalba+ 2018, in prep

TESS transit probabilities account for varying baseline

How many RV exoplanets will *TESS* see in transit?



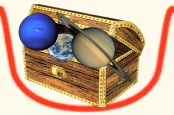
Only ~3 will be novel (not previously known to transit)

In the Primary Mission:

125 RV exoplanets will have

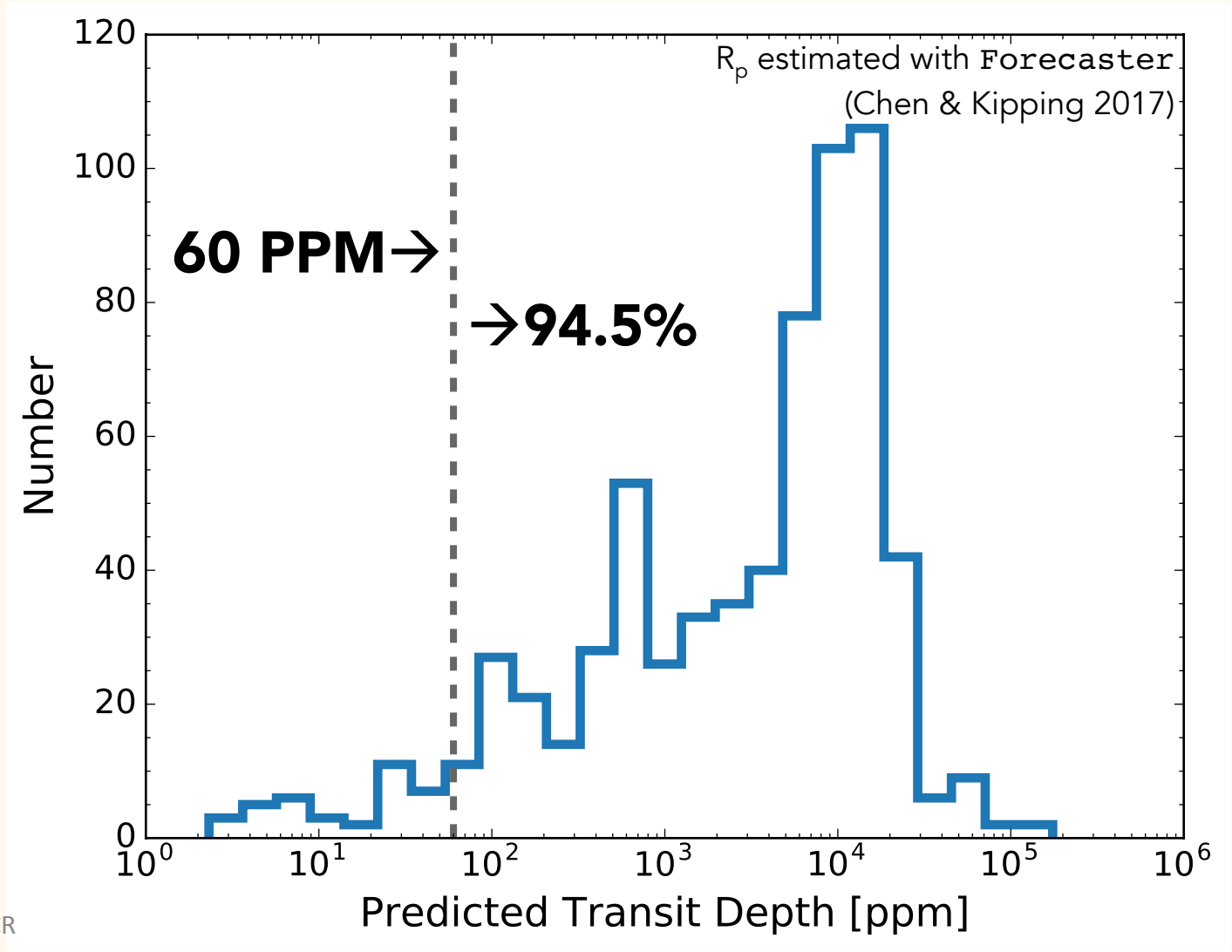
Observational Baseline $>$ Orbital Period

Potential *TESS* Extended Mission

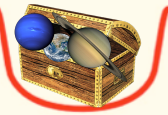


- All-sky scenarios yield ~one new detection of a transiting RV exoplanet per year
- No difference between repeating primary mission strategy or reducing sector duration
- There are 13 RV exoplanets with P>100 days within 13° of an ecliptic pole!

Will poor pixel precision plunder planet transits?



Known RV Exoplanets arrrr a Treasure Trove of *TESS* Early Science!



- **~25** RV exoplanets are transiting (but only **12** known currently)

- *TESS* (primary mission) will discover **~3** novel transiting RV exoplanets and rule out transits for **>100** others!

- There are **13** RV exoplanets with **P>100 days** near the poles that could be targeted in an extended mission