Reproducing the results for NICER observation of PSR J0030+451
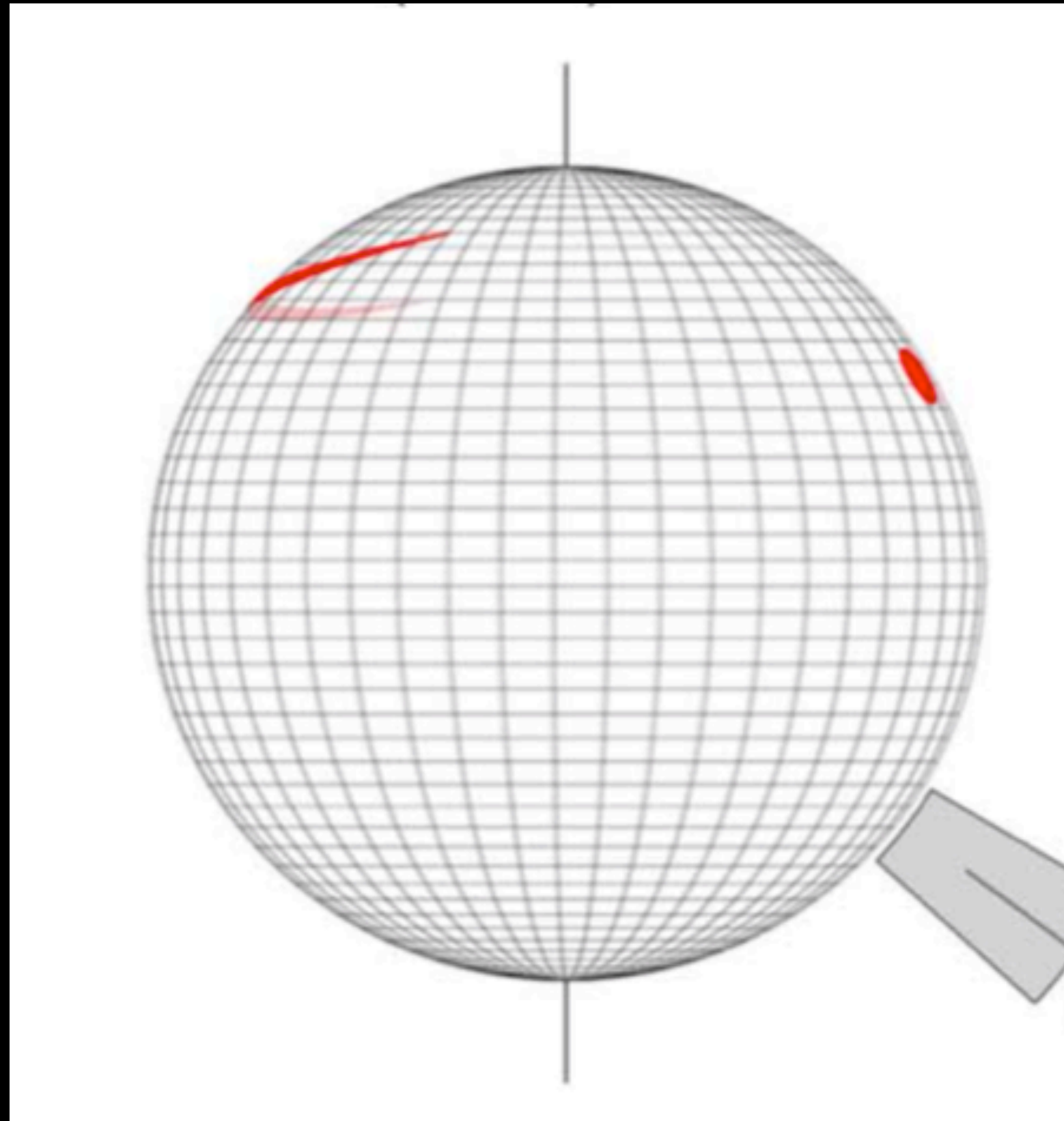
Chaitanya Afle
Syracuse University

Overview of the talk

- Reproducible research

- Re-analysis of Riley et al. study

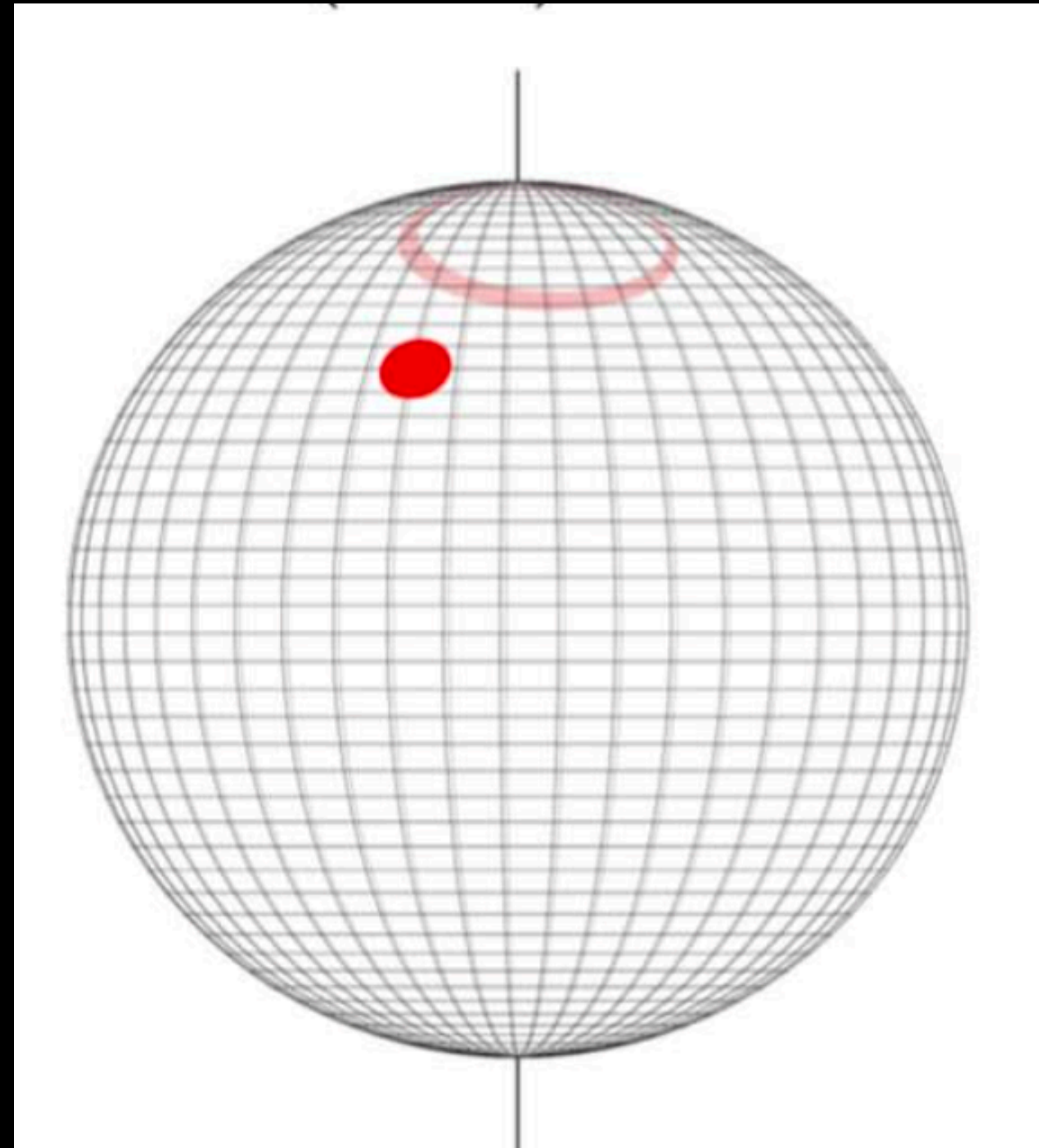- Docker container to aid the portability of the software

Scientific reproducibility

When an analysis/experiment is repeated in the same conditions and arrives at same result.

ST+PST

ST+EST
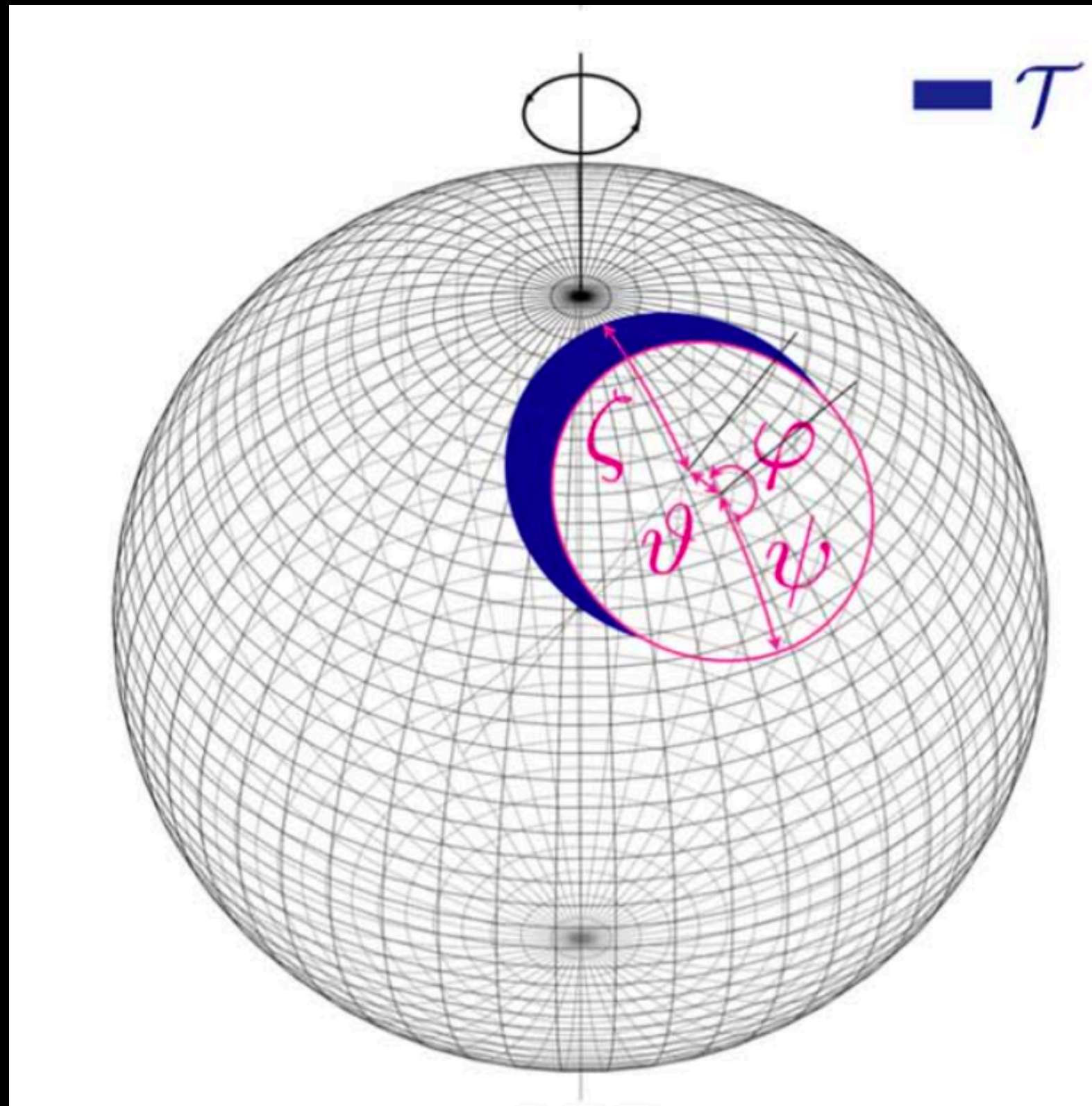

Analysis of PSR J0030+451 data observed by NICER

- Riley et al. release a zenodo repository

- The repository has the data used by the analysis as the input

- Includes configuration files used for XPSI v0.1 - used by different hotspot models

- It also has the output posterior files

Riley et al. ApJL, 887, L21 (2019)
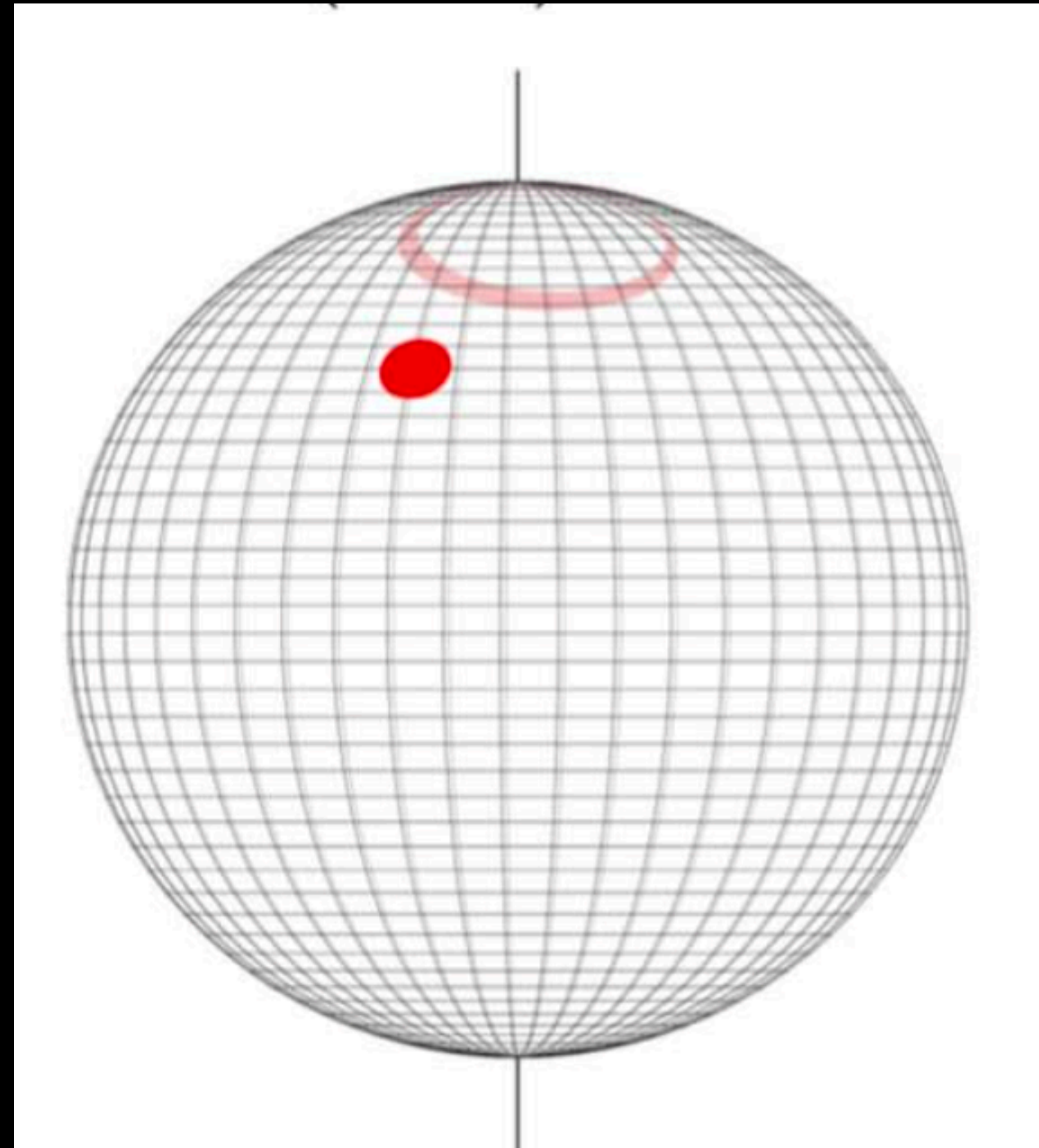Also see Anna Watts' talk from Monday

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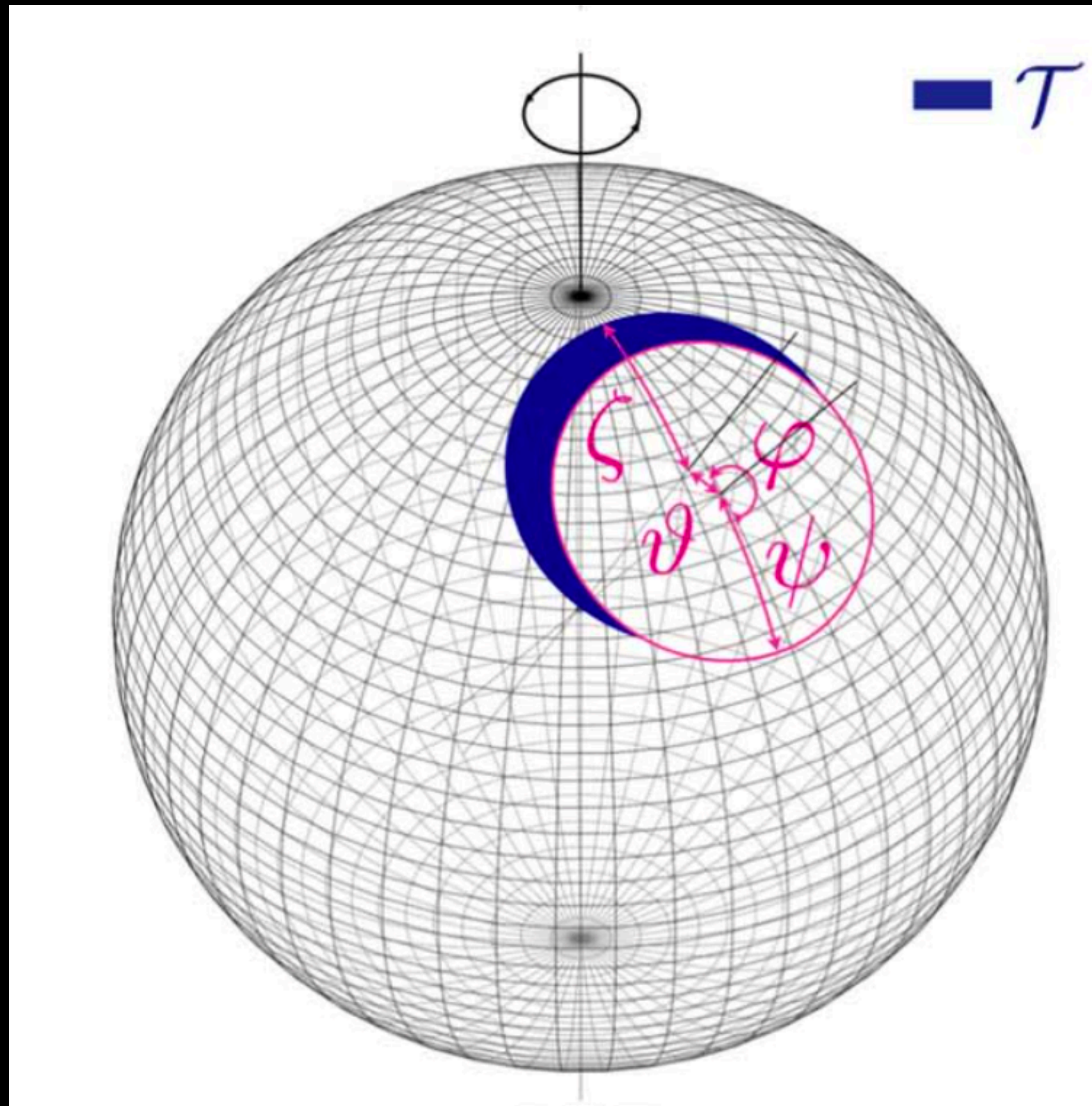Analysis of PSR J0030+451 data observed by NICER

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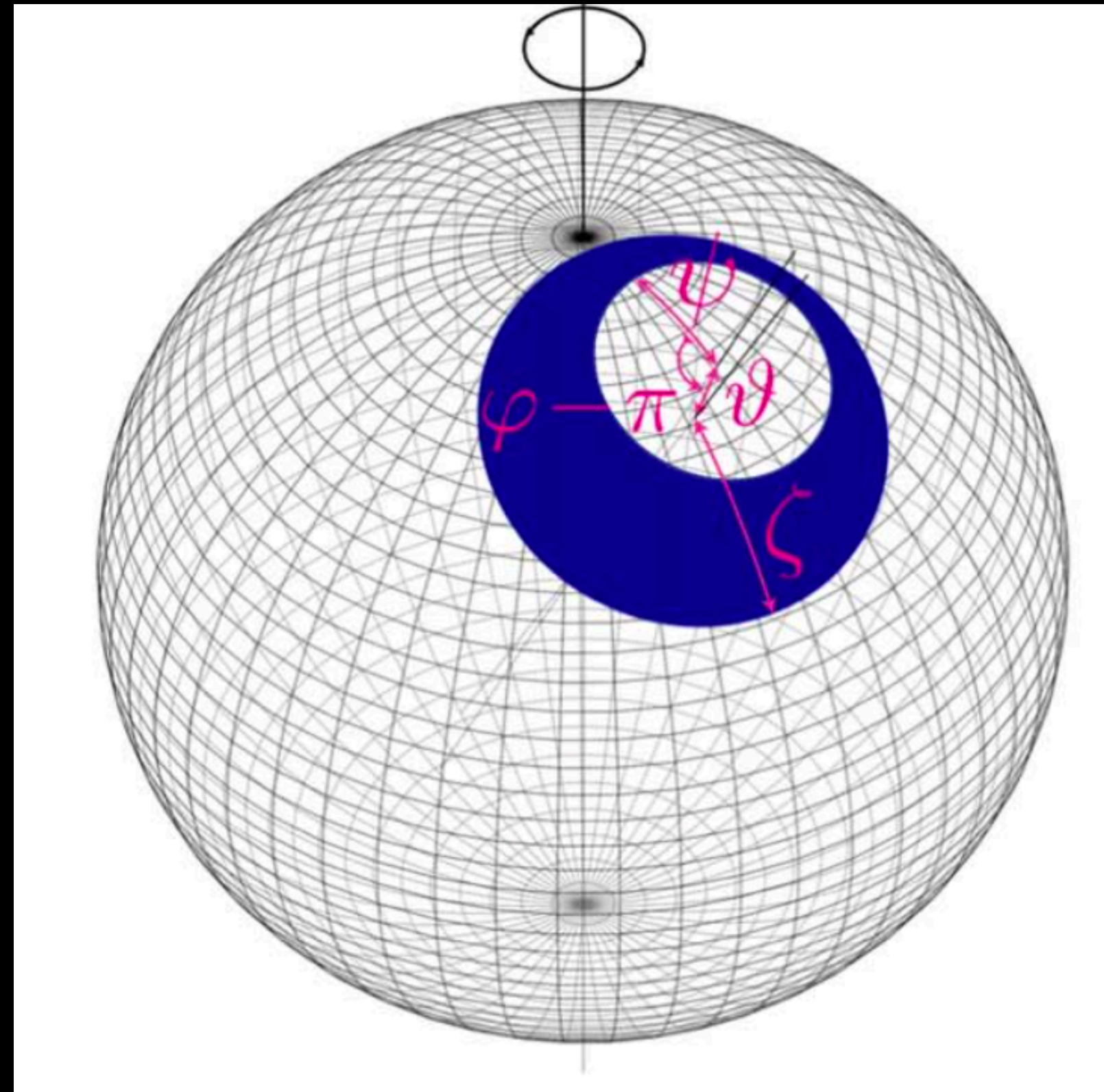Also see Anna Watts' talk from Monday

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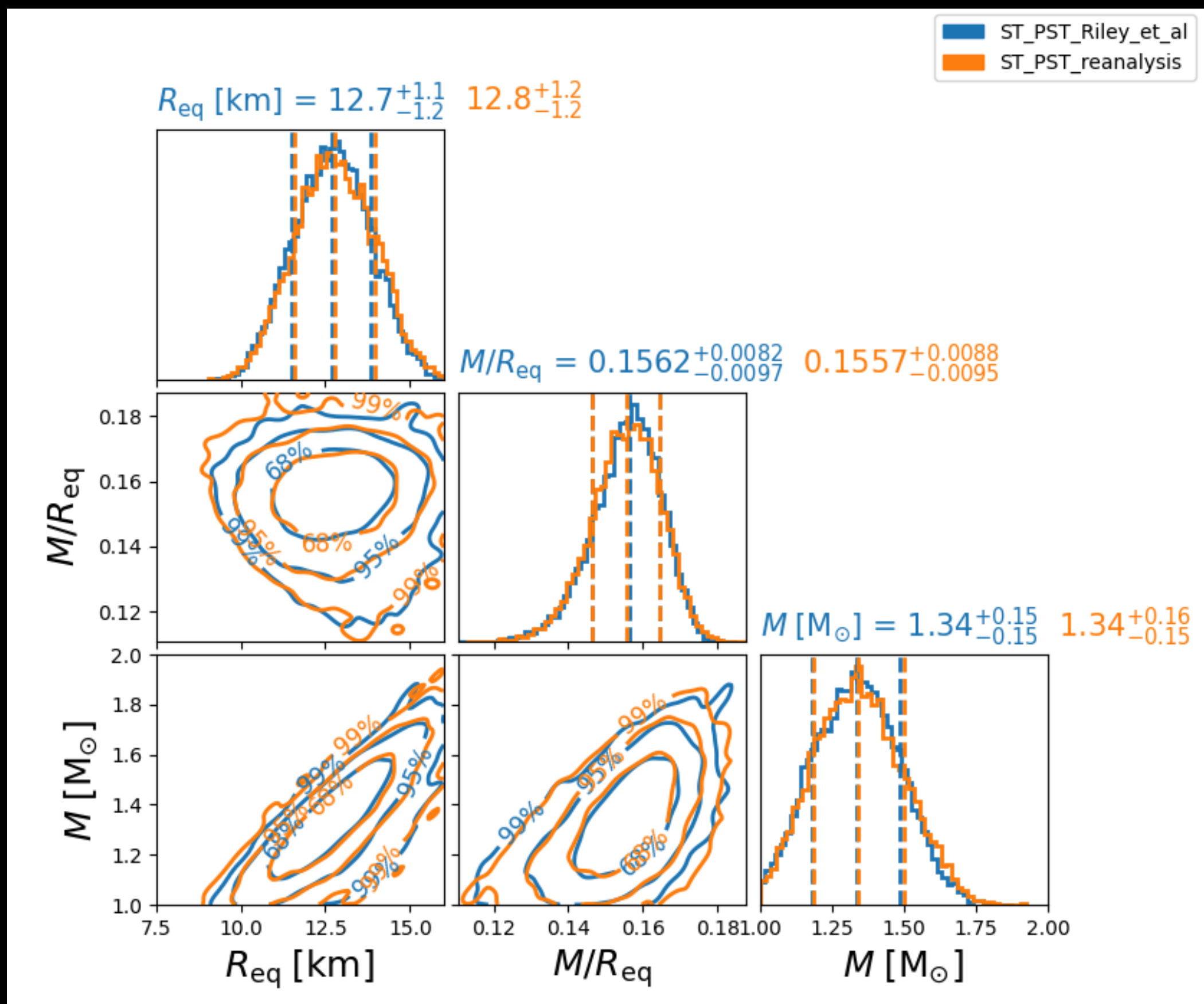
ST+PST

ST+EST

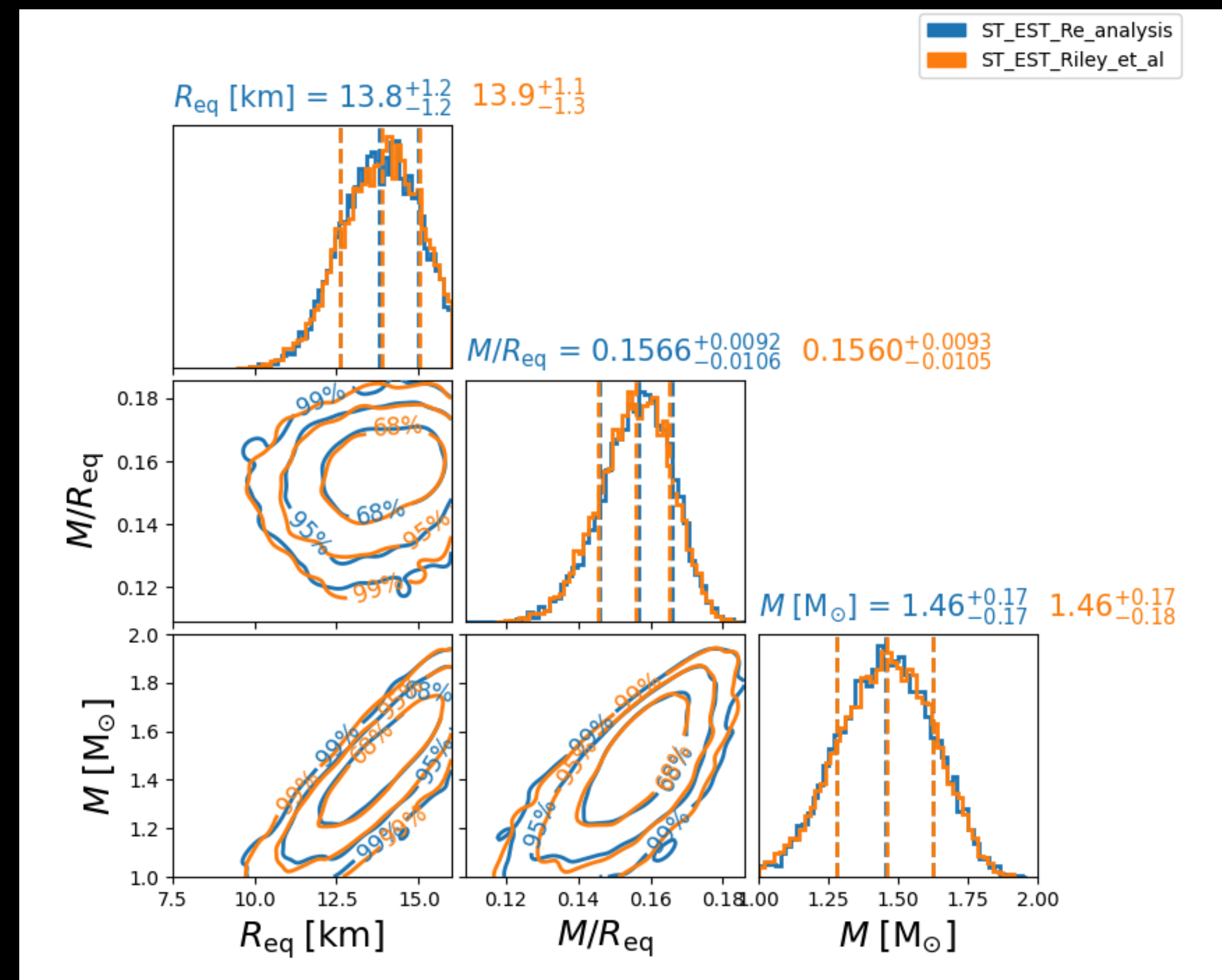Analysis of PSR J0030+451 data observed by NICER

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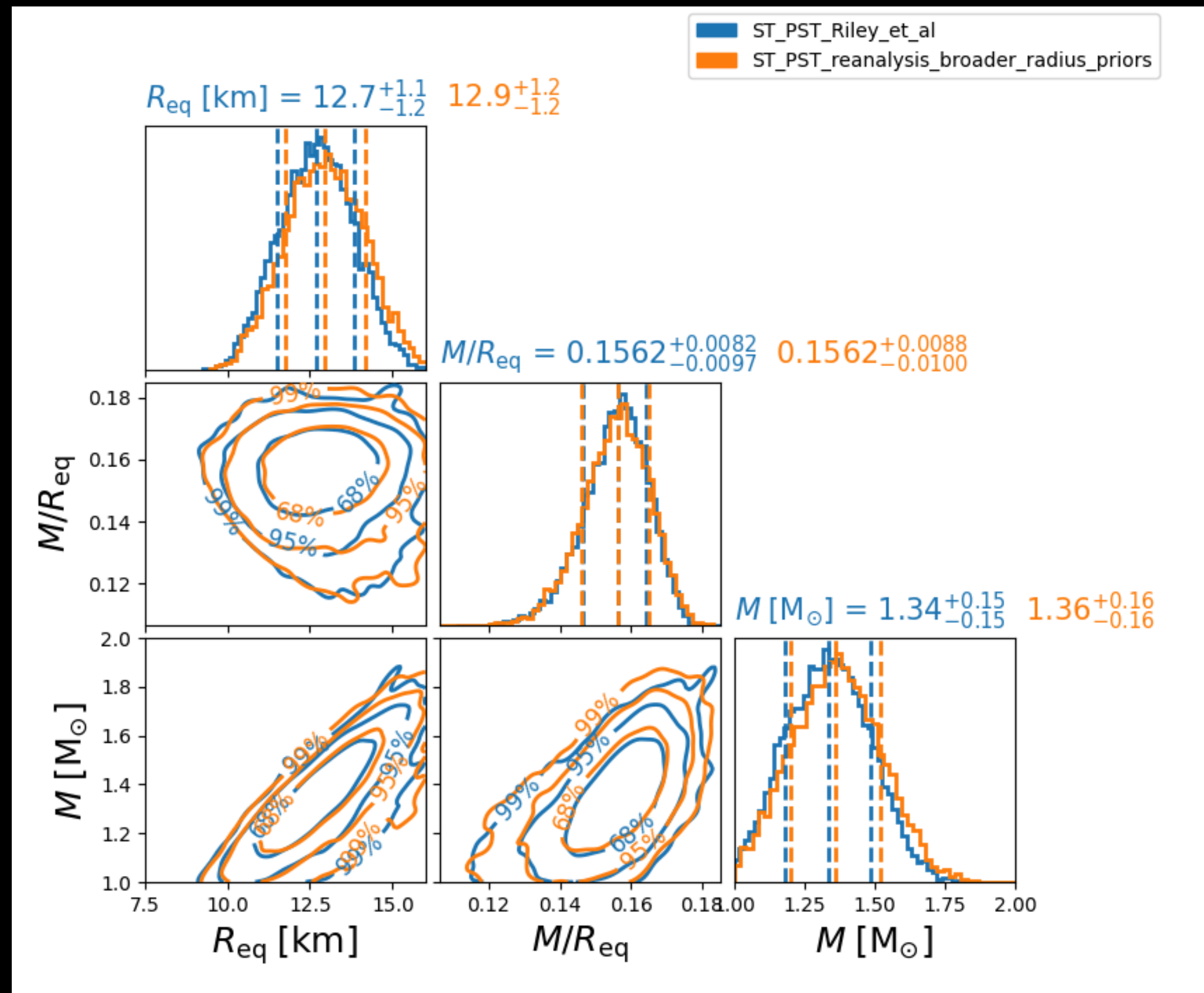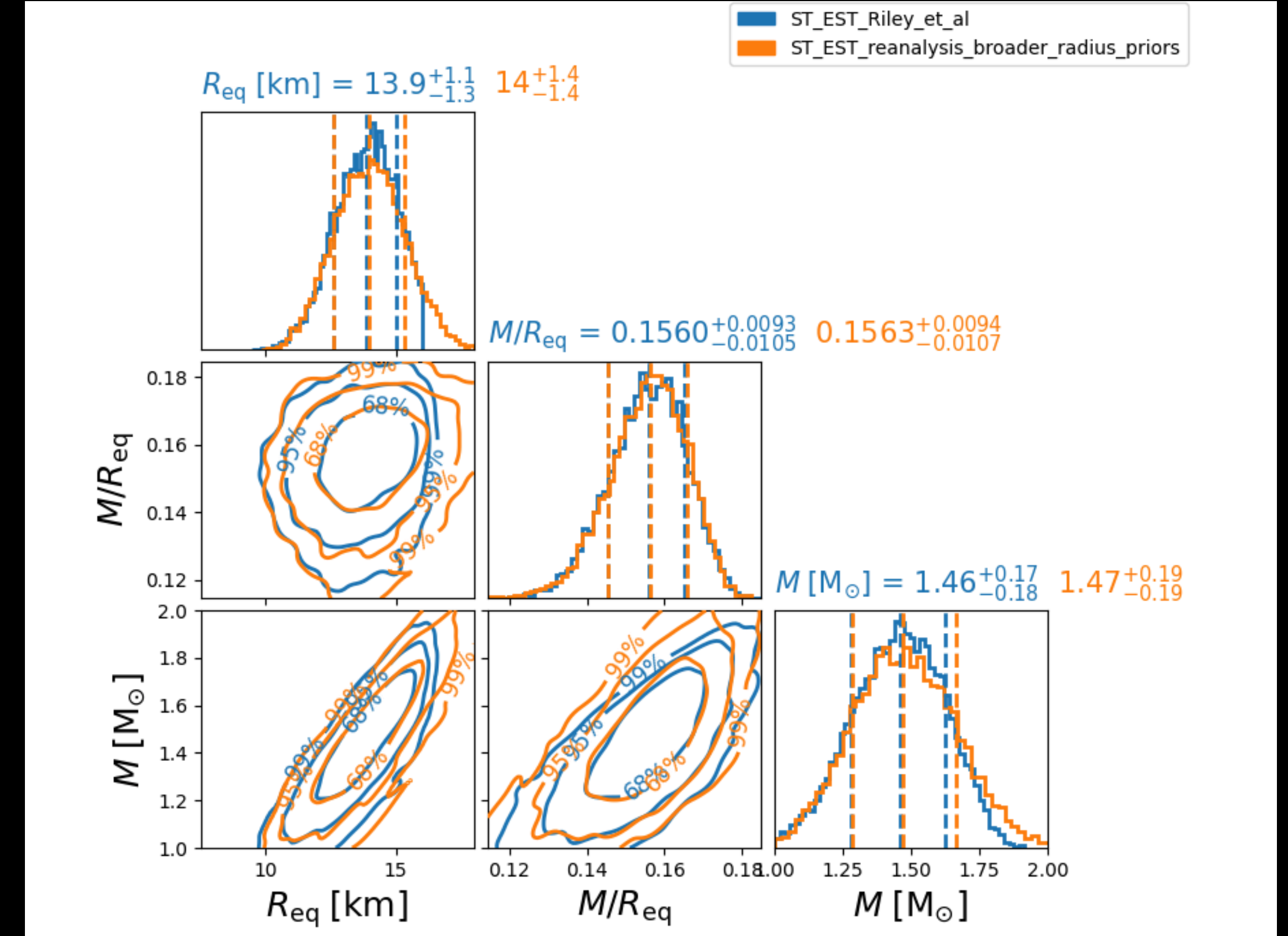Also see Anna Watts' talk from Monday

Results

ST+PST

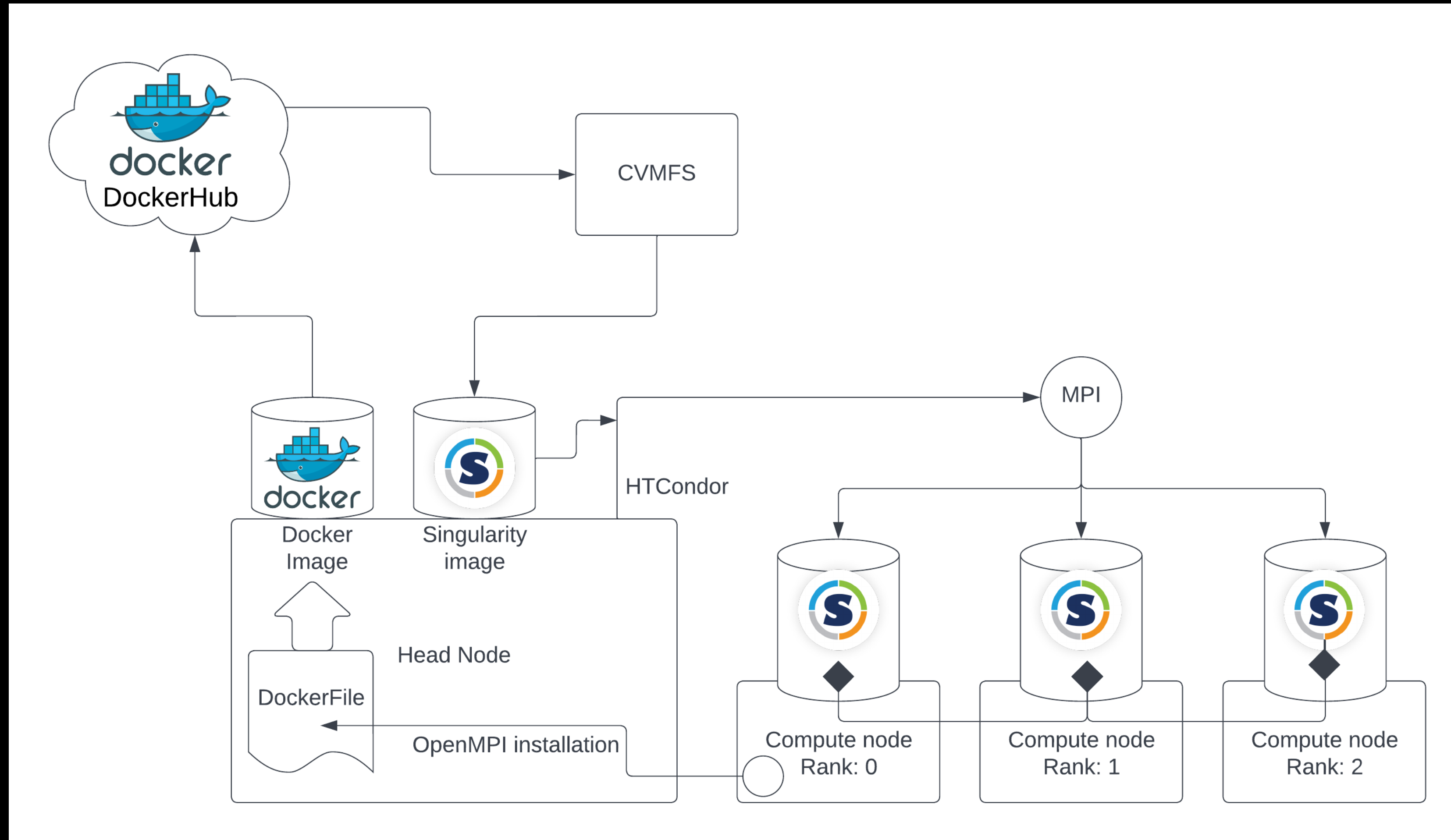
ST+EST

Results - broader radius priors

ST+PST

ST+EST

Data is more informative than the prior

Schematic of the software components

We deliver a Docker container to aid the portability of a working instance of XPSI v0.1

(https://hub.docker.com/r/chaitanyaafle/nicer)

Thank You!

This work was done in collaboration with: