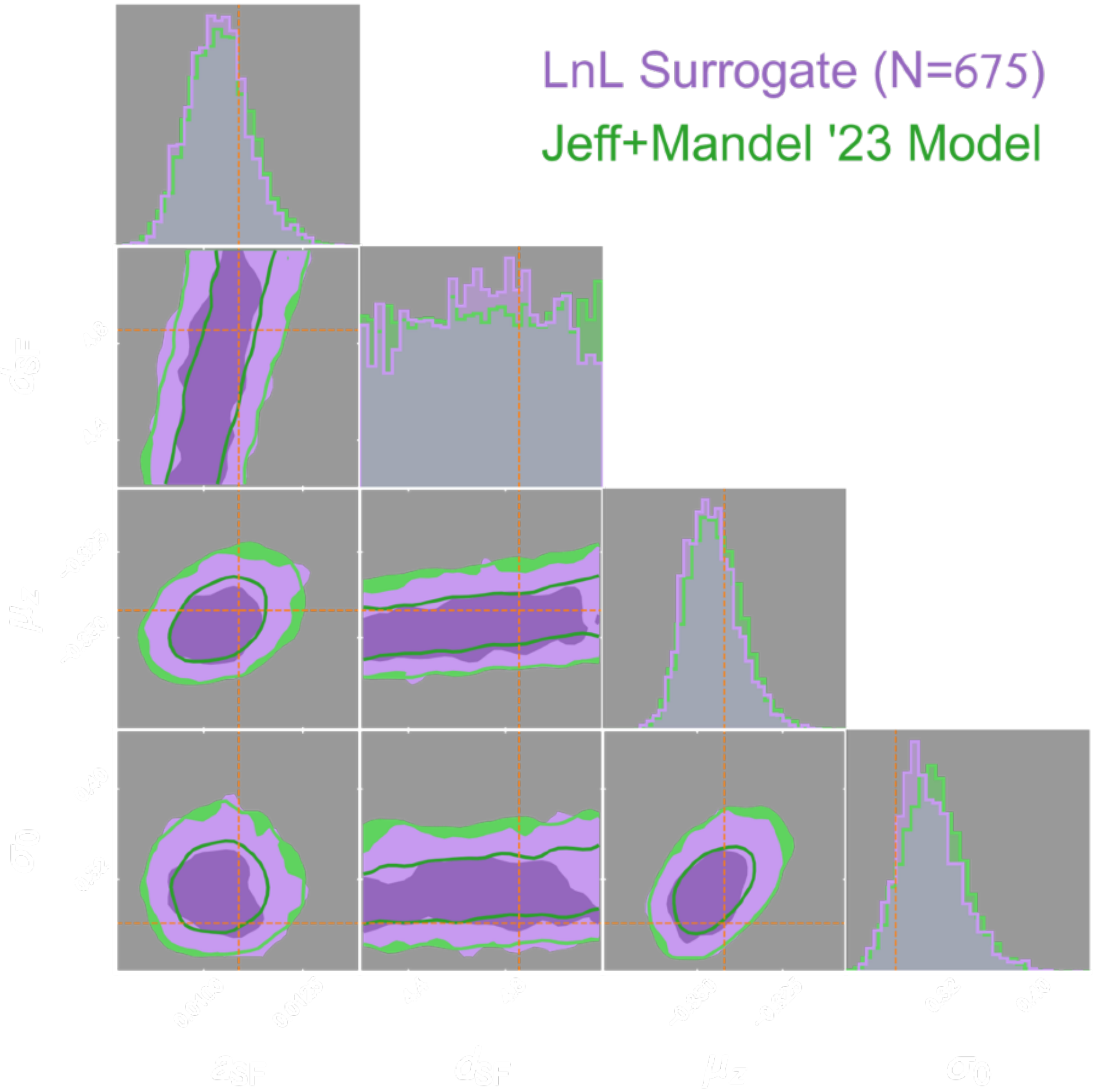
LnL Surrogate (N=675)

Jeff+Mandel '23 Model



Active learning for the surrogate Likelihood

GP LnL Surr

Jeff+Mandel ’23
COMPAS Surr

Speedup $\times 10^6$

200-700 pts

Retrain for new $\mathscr{D}$

Easier to expand Λ


Speedup x10^6

100,000 pts

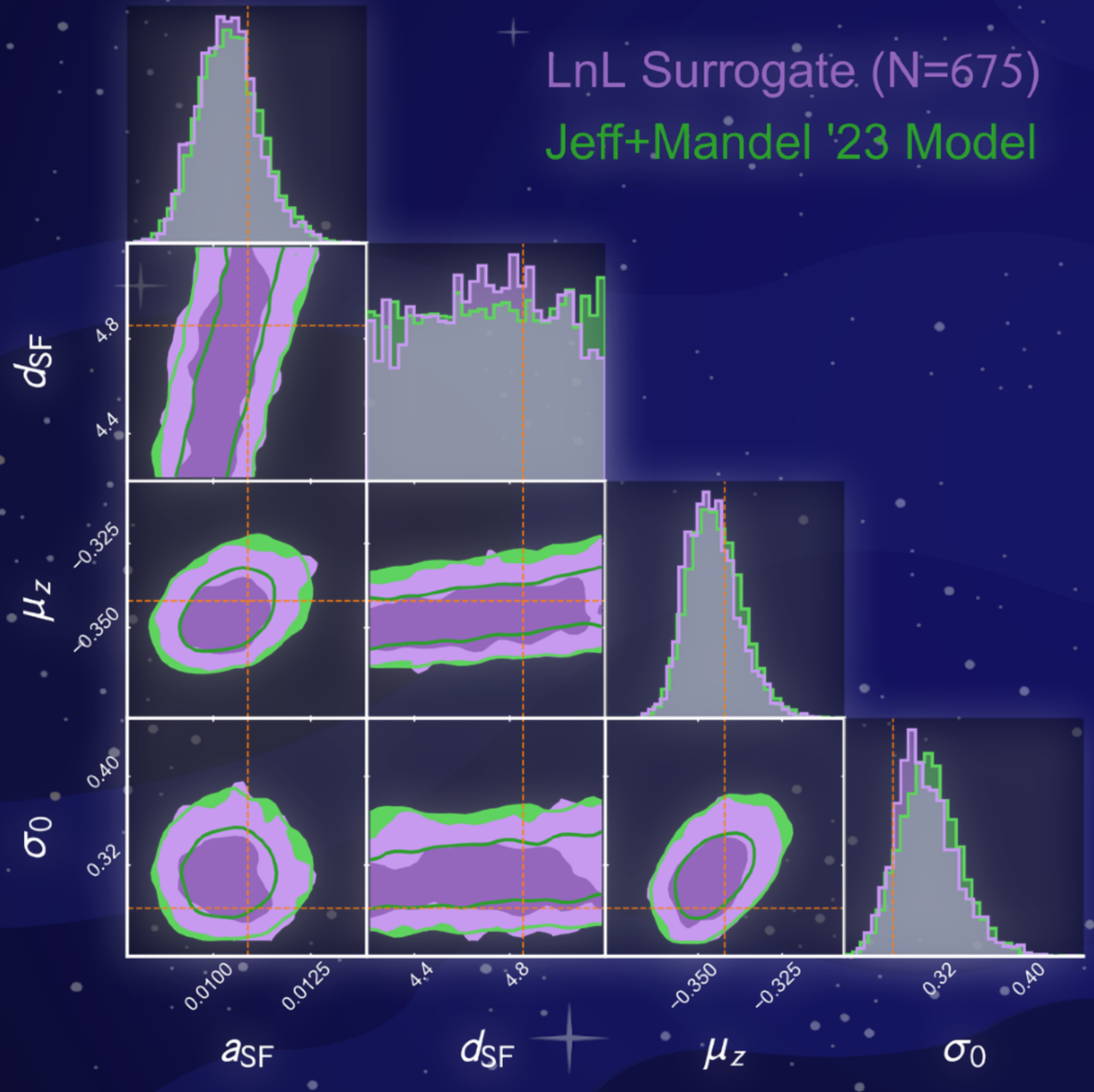
Works for new $\mathscr{D}$

New $\Lambda \rightarrow$ new training set

19/20

Bayesian optimisation

Active learning for the surrogate Likelihood



GP LnL Surr	***Jeff+Mandel '23 COMPAS Surr***
Speedup x10^6	Speedup x10^6
200-700 pts	100,000 pts
Retrain for new $\mathscr{D}$	Works for new $\mathscr{D}$
Easier to expand Λ	New $\Lambda \rightarrow$ new training set

Summary

- Forward population modelling challenging
- GP surrogate for LnL can help
- GP surrogate can use fewer training points to obtain similar posteriors
- ***Some Drawbacks:***
  - Need to retrain for new data
  - Tuning parameters?

Future Work

- Build a better acquisition function
- Increase Λ
- Determine COMPAS population sizes needed for different Λ