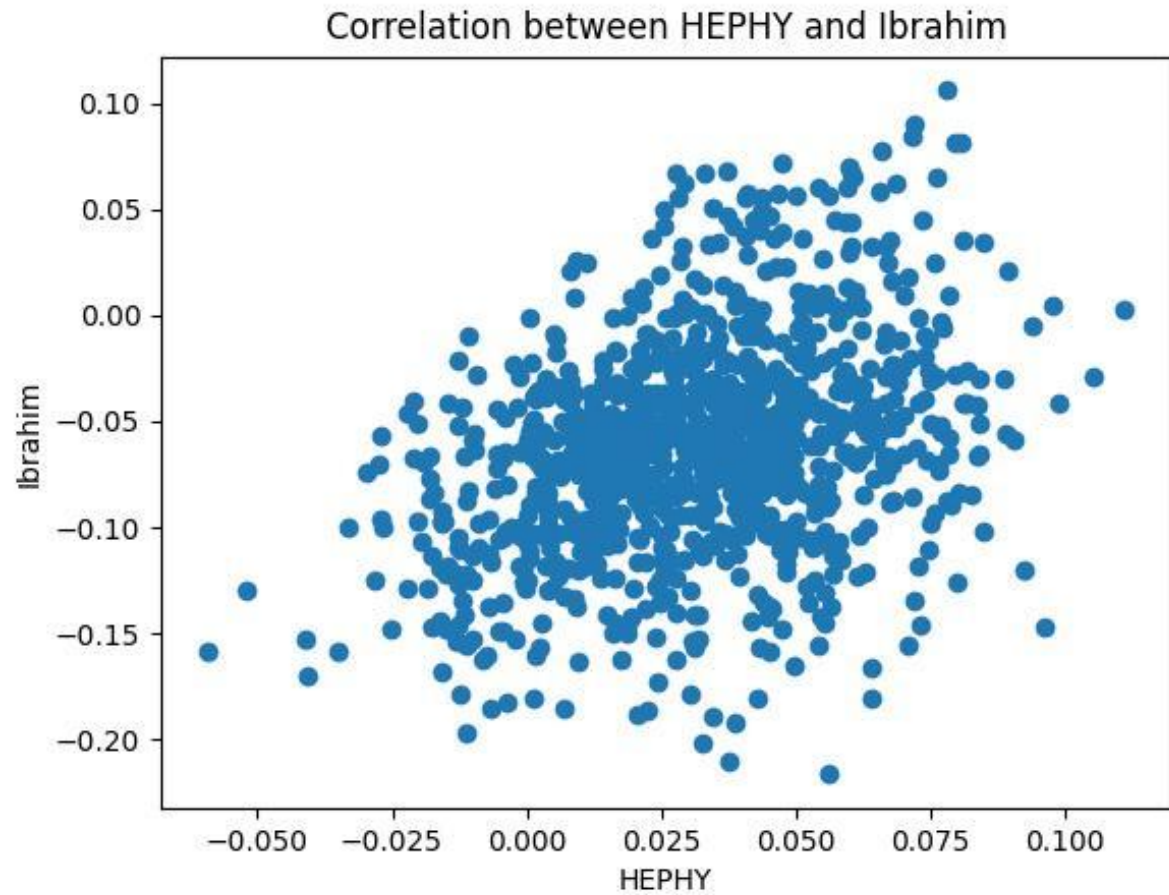


Outlook



Is there an even better model ?

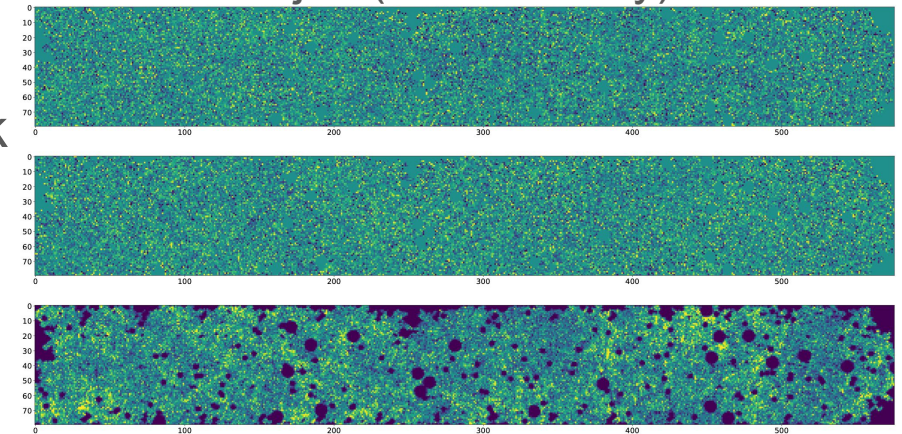
...most likely:



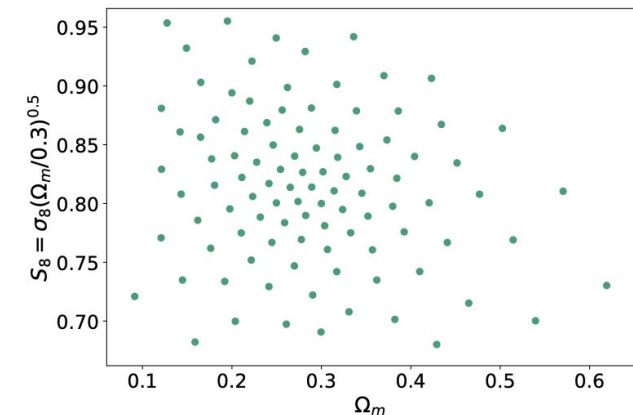
Fair Universe - Weak lensing Challenge

with Biwei Dai (IAS) and Uroš Seljak (UC Berkeley)

- Submitted to NeurIPS 2025 Competition track
- Goal to determine cosmological parameters (Ω_m and S_8), and uncertainties, from large simulated weak gravitational lensing dataset
- Various realistic systematic effects including baryonic effect, intrinsic alignment, photometric redshift uncertainty, shear measurement bias, point spread function, and source clustering effect
- Second phase test data with different (OoD) physical models



Shear maps γ_1 and γ_2 and weight map



101 different cosmological models

Conclusion

- A major new scientific competition on measuring Higgs signal strength,
 - taking into account/minimizing impact from modelisation systematics
 - winner to provide a narrow confidence interval with good coverage
- Dataset has been [released permanently on Zenodo](#) : 28 features times 220 million events, 15GB, (plus 120 million kept private)
 - Setting up long-term benchmark leaderboard to be linked from Zenodo page
- Can be used in the future for
 - further improve on signal strength CI metric
 - improving signal strength CI while minimising number of training event or compute resource
 - or more specific : approximate density/density ratios over several order of magnitude
 - biases can be made more complex (e.g. $E_{\tau_data}=f(E_{\tau})$ instead of $E_{\tau_data}=TES \times E_{\tau}$)
 - technical throughput studies on different hardware
 - ... your suggestions