

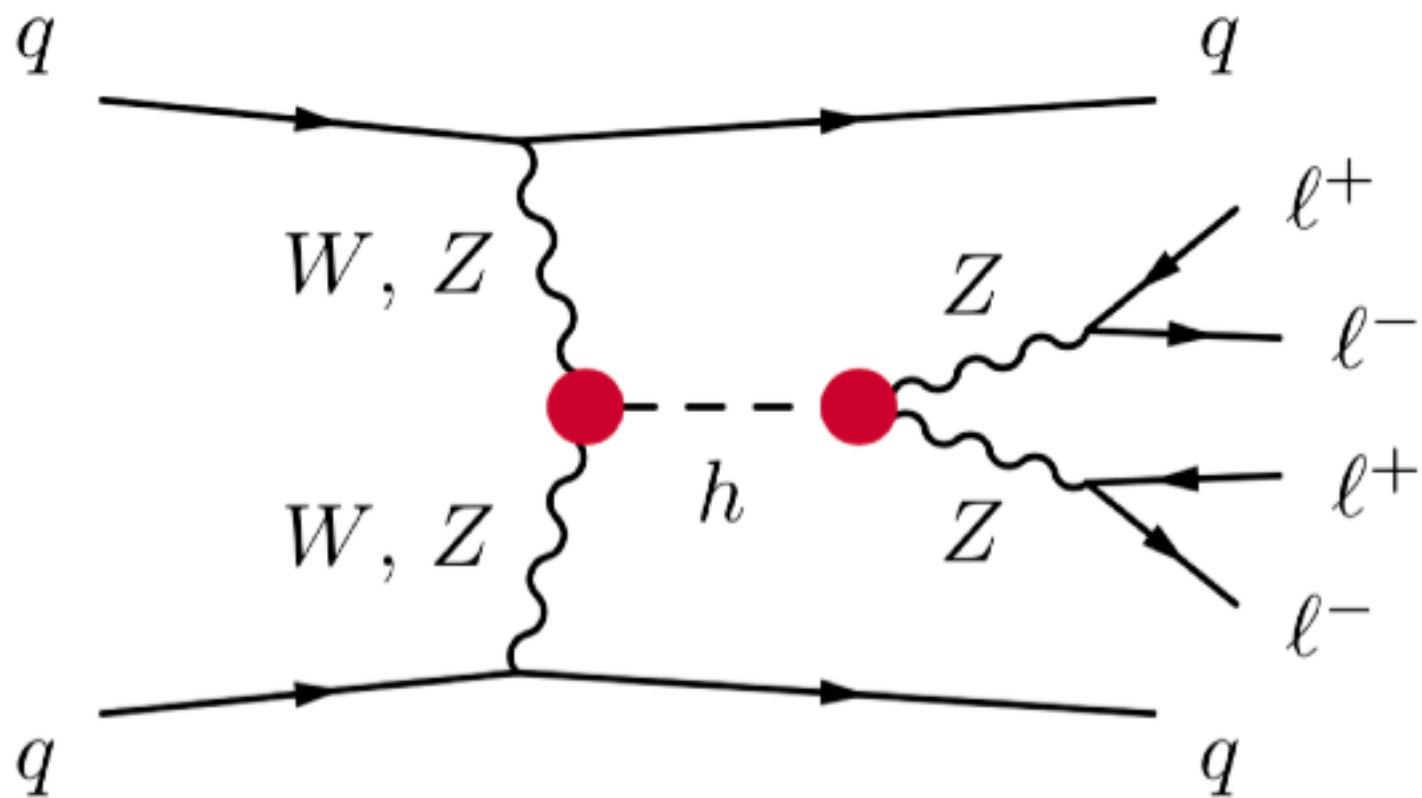
Siddhant Mishra-Sharma (MIT/AI FI) Summer School

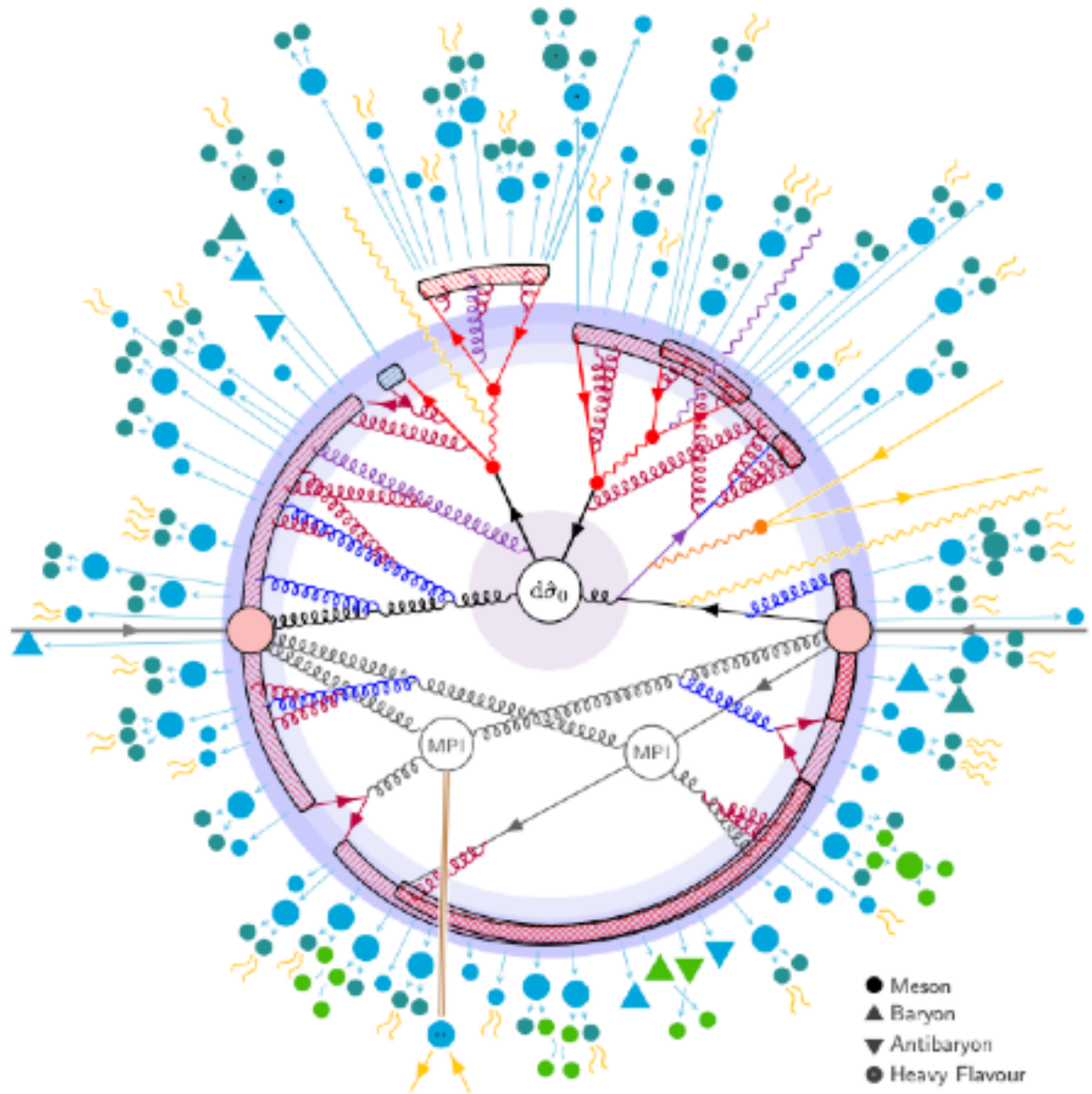
170



Are simulators all you need?

Sample from





[Pythia]



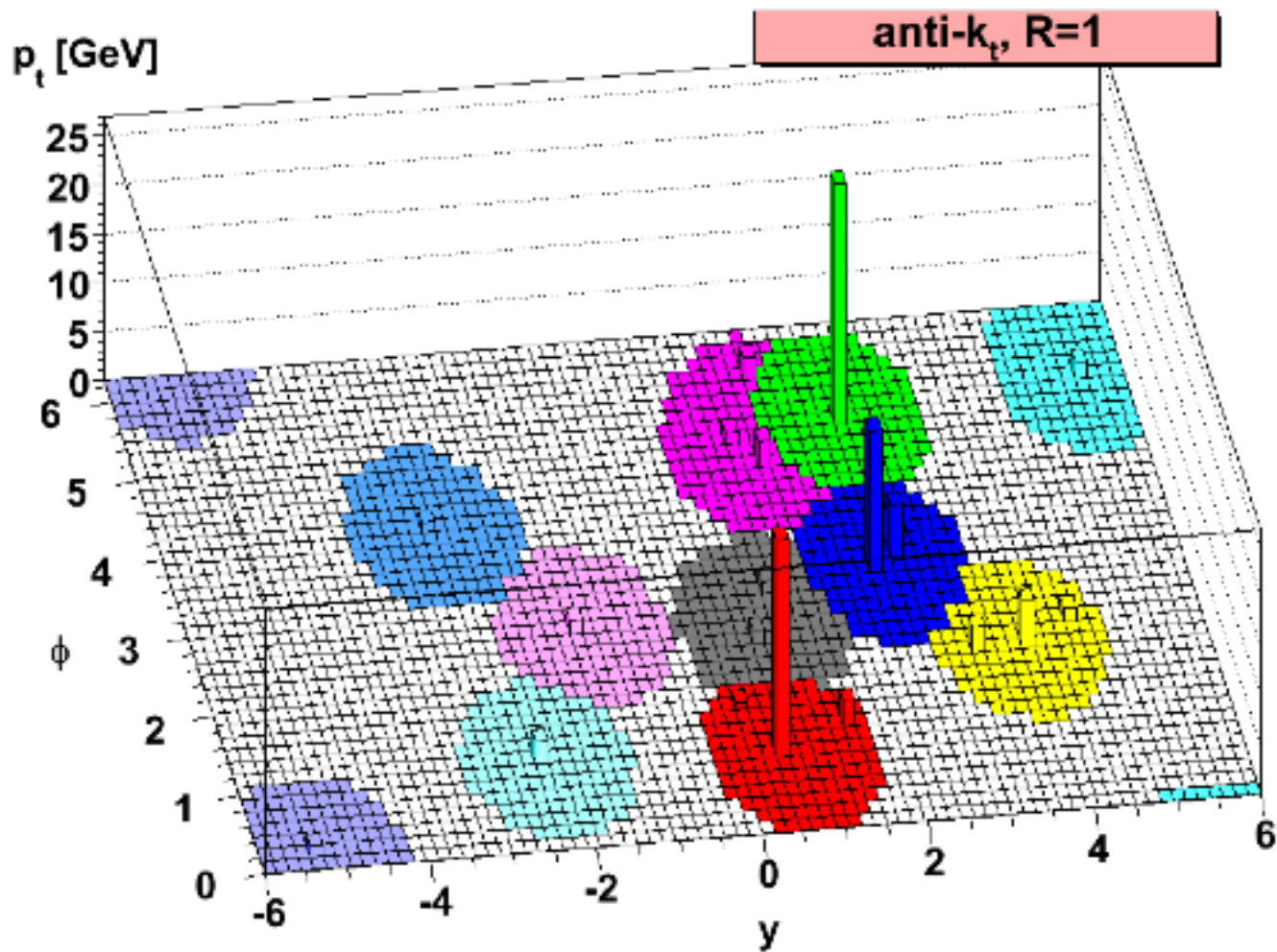
Evolution



Prediction (simulation)



Inference



[M. Cacciari, G. Salam, G. Soyez 0802.1189]

Detector interactions

z_d



Shower
splittings

z_s



Parton-level
momenta

z_p



Theory
parameters

θ

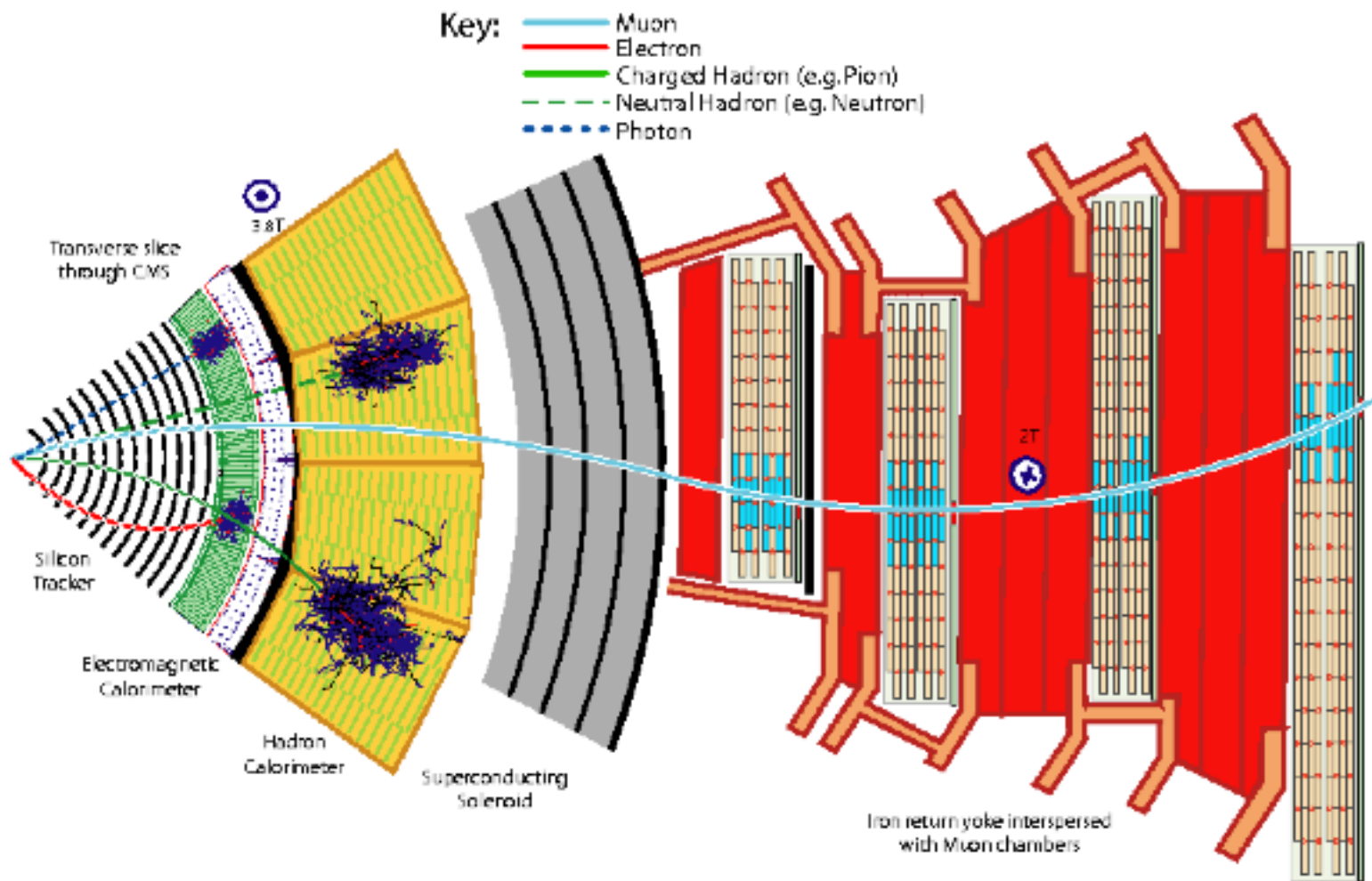
Observables

x



$$p(x|z_d) \quad p(z_d|z_s) \quad p(z_s|z_p) \quad p(z_p|\theta)$$

$$p(x|\theta) = \int \mathrm{d}z_d \int \mathrm{d}z_s \int \mathrm{d}z_p$$



[CMS]



It's infeasible to calculate the
integral over this enormous space!

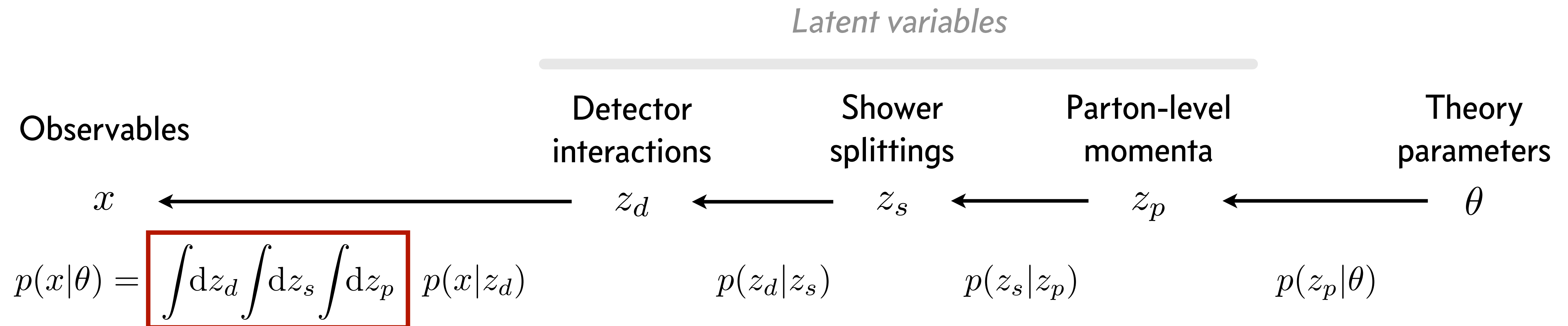
Latent variables





side: Johann Brehmer

Are simulators all you need?



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integral over this enormous space!

Inference

What could we do with $p(x)$?