

ySSH Altimetry observations estimation

$$f_{\phi,\psi}\in\mathcal{F}$$

### State estimation

Variational data assimilation

$$\hat{x} = rg \min_{x} \left[ J(x, y) \right]$$

Neural network inference  $\psi$ 

$$\hat{x}=x^N=x^{N-1}-\psi(
abla_xJ(x^{N-1},y))$$

### **SSH** estimation

Grid interpolation



distribution

# **State formulation**

- SSH Grid  $x_{ssh}$  Augmented state

$$x=\left(x_{ssh},x_{aug}
ight)$$

Scale decomposition

$$x=\left(x_{ss},x_{ls}
ight)$$

# **Prior formulation**

Energy based modeling  $\phi$ 

$$E(x) = \|x - \phi(x)\|_{l2}$$