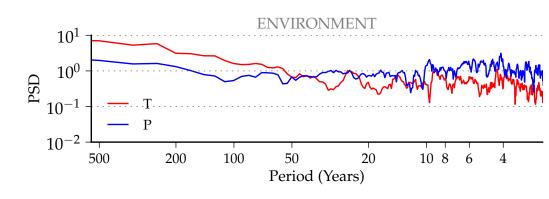# PROXY SYSTEM MODEL: ICE CORE δ^{18}O

Simulated MTM spectra for each transformation, Quelccaya
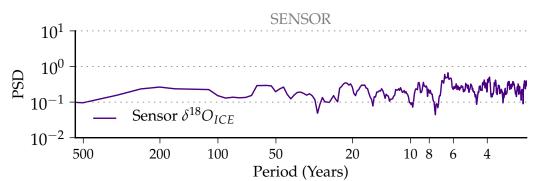
INPUTS:
temperature
precipitation

$T, P, \delta^{18}O_P$

SENSOR:
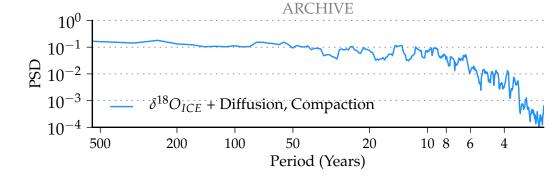precipitation weighting
altitude & temperature
bias corrections

$\delta^{18}O_{ICE} = \sum(p \cdot \delta^{18}O_P)/\sum p$
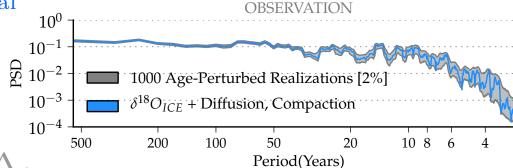
ARCHIVE:
compaction
diffusion

$G = \dfrac{1}{\sigma\sqrt{2\pi}} \cdot e^{\frac{-z^2}{2\sigma^2}}$

$\delta_{\text{diffused}} = G \star \delta_{\text{original}}$

OBSERVATION:
layer counting
isotope analysis

$t_i = t_{i-1} - 1 - \Delta_i$

ENVIRONMENT

PSD

— T
— P

Period (Years)

SENSOR

PSD

— Sensor $\delta^{18}O_{ICE}$

Period (Years)

ARCHIVE

PSD

— $\delta^{18}O_{ICE}$ + Diffusion, Compaction

Period (Years)

OBSERVATION

PSD

■ 1000 Age-Perturbed Realizations [2%]
■ $\delta^{18}O_{ICE}$ + Diffusion, Compaction

Period(Years)