

Model parameters Θ_i

Satellite observations
(surface ice velocity u_s)

Seismic observations
(measured acoustic impedance Z^*)

Surface-to-bed inversion
(basal ice speed u_b and drag τ_b)

Effective pressure N derived
from different sliding laws i

Viscous Grain-Shearing theory
(predicted acoustic impedance Z_{Θ_i})

Acoustic impedance misfit $\chi^2_{\Theta_i}$

Prior distributions

Bayesian model selection
(most probable sliding law)

Likelihood function

