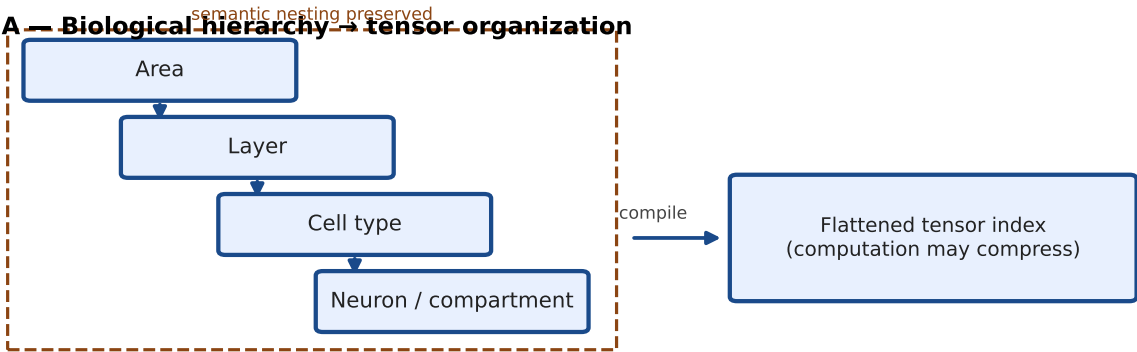


Figure 1 — TFNE mathematical / architectural grammar

Neural Biology $\rightarrow (X, H, \Theta, B, \mathcal{G})$ State $\rightarrow E \rightarrow S \rightarrow F \rightarrow P$ Typed operators $\rightarrow$ Observation

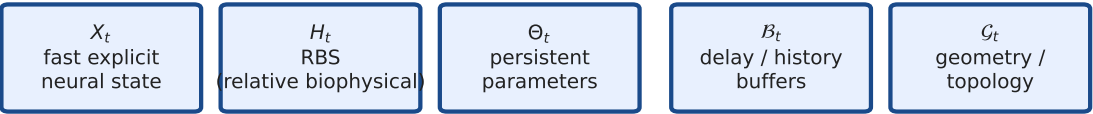
$\mathcal{G}$ conditions coupling, delay, field, and probe — not a terminal processing step

A — Biological hierarchy $\rightarrow$ tensor organization



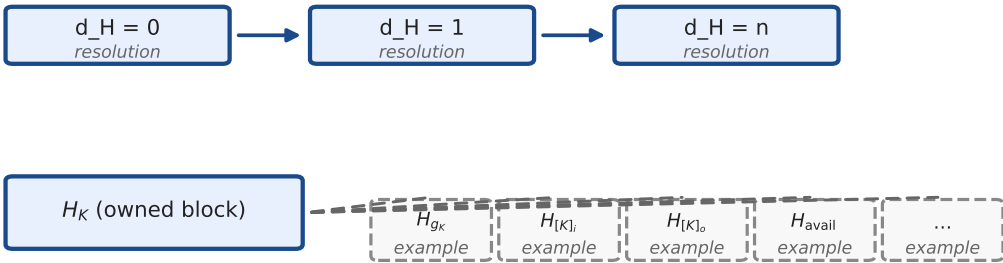
B — TFNE complete state

$$\mathcal{X}_t = (X_t, H_t, \Theta_t, B_t, \mathcal{G}_t, \dots)$$



Markov state container — not a single homeostatic scalar

C — RBS containment / fidelity ladder

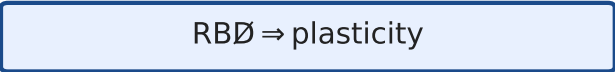
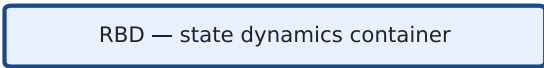


user-selected physical resolution — not all coordinates implemented

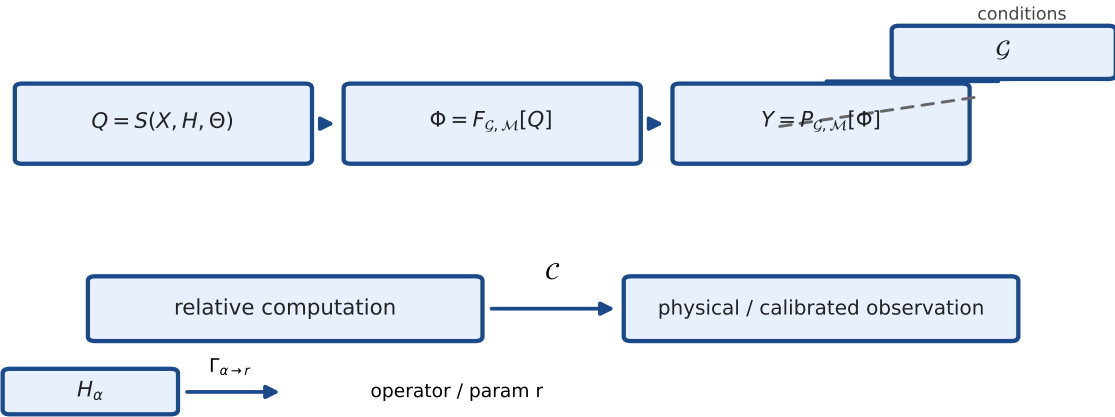
D — RBD / HDP distinction

$$\dot{X} = F_X(X, U; \Gamma(H, \Theta))$$

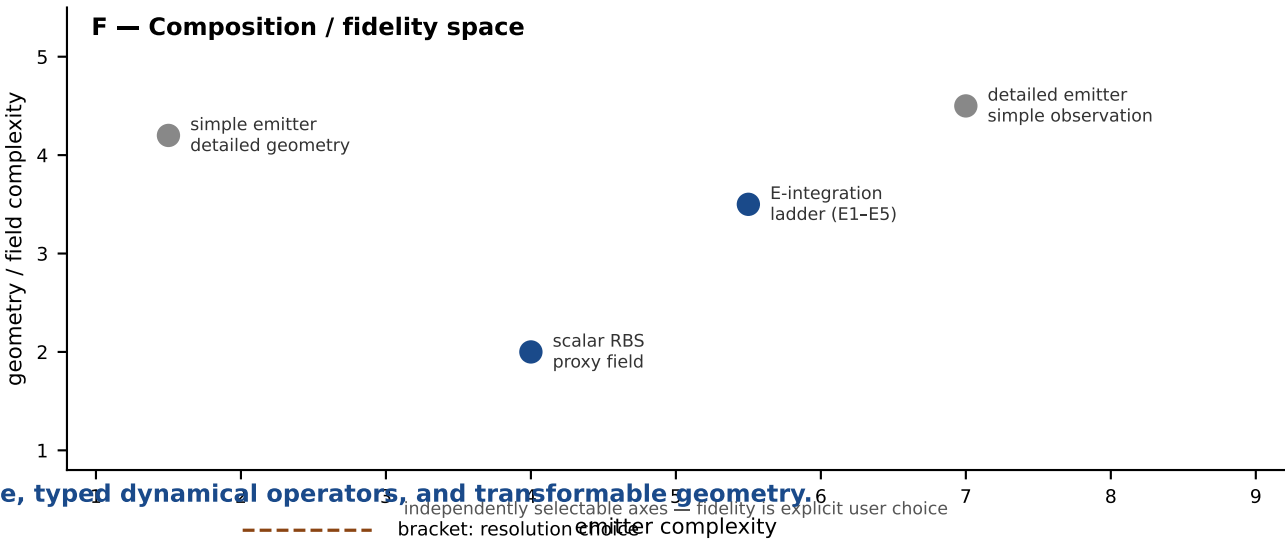
$$\dot{H} = F_H(H, X, \dots)$$



E — Source $\rightarrow$ Field $\rightarrow$ Probe



F — Composition / fidelity space



TFNE factorizes neural biophysics into relative finite-dimensional state, typed dynamical operators, and transformable geometry.

solid: typed computational dependency
dashed: optional / refinement
DEMONSTRATED grammar
REPRESENTATIONAL example