Bayes theorem: posterior is proportional to prior times likelihood

$$\mathbb{P}(t|\mathcal{Y}) \propto \mathbb{P}(t)\mathbb{P}(\mathcal{Y}|t)$$
$$\mathbb{P}(\mathcal{Y})\mathbb{P}(t|\mathcal{Y}) = \mathbb{P}(t)\mathbb{P}(\mathcal{Y}|t).$$

$\mathcal{Y}$: data

Σ_r : rooted splits, i.e. bipartitions

$\mathcal{F}_\mathcal{T}$: Borel σ-algebra on trees

$\pi_\mathcal{Y} : \mathcal{F}_\mathcal{T} \to [0, \infty)$: unnormalized posterior target measure given $\mathcal{Y}$. AKA π.

$\gamma_\mathcal{Y} : \mathcal{F}_\mathcal{T} \to [0, \infty)$: unnormalized posterior density (think $\mathbb{P}(t)\mathbb{P}(\mathcal{Y}|t)$). AKA γ.

γ_* : extension of γ to partially-coalesced trees

$\|\pi\|$: $\pi(\mathcal{T})$, the total posterior, equal to $\mathbb{P}(\mathcal{Y})$ by Bayes

$\bar{\pi}$: normalized measure $\pi/\|\pi\|$

ϕ : test function, here a function from trees to the real line

$\bar{\pi}(\phi)$: expectation of ϕ with respect to $\bar{\pi}$

s : particle

$s_{r,k}$: kth particle at generation r (non-uniformly weighted)

$w_{r,k}$: weight of $s_{r,k}$, $\frac{\gamma_*(s_{r,k})}{\gamma_*(\tilde{s}_{r-1,k})q(\tilde{s}_{r-1,k} \to s_{r,k})}$

$\tilde{s}_{r,k}$: resampled kth particle at generation r (uniformly weighted)

ν_s : proposal measure starting at s

$q(s \to s')$: density of ν_s starting at s

$\rho(s)$: rank or "generation number" of particle s

$\pi_{r,K}$: (random) empirical measure from running algorithm with K particles

$\lambda_{r,K}$: (random) measure of the particles *proposed* at generation r, which is $\pi_{r,K}$ applied to the pre-image of ν

π_r : (fixed) measure with Radon-Nikodym derivative γ_* at generation r