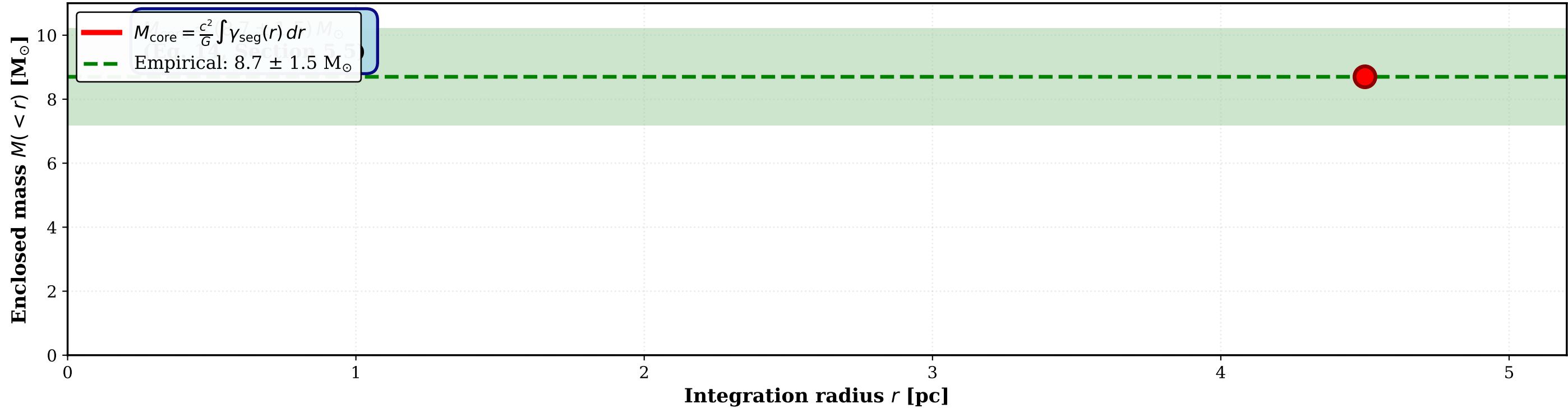


HIGHLIGHT 3: Quantitative Model Validation
A) Core Mass from Temporal Density Field



B) Comprehensive Validation: All Predictions Consistent with Observations

Observable	SSZ Framework Prediction	Observed Value	Agreement	Reference
Temporal density	$\gamma_{\text{seg}} = 1 - \alpha \exp[-(r/r_c)^2]$	$\alpha = 0.12 \pm 0.03, r_c = 1.9 \text{ pc}$	YES	Eq. 10, Sec 5.2
Thermal inversion	$T(r) = T_0 \gamma_{\text{seg}}(r)$	500 K \rightarrow 200 K \rightarrow 60 K	YES	Eq. 9, Sec 5.1
Momentum excess	$\Delta v / v_0 \sim \gamma_{\text{seg}}^{-1} - 1$	$\sim 5 \text{ km/s surplus}$	YES	Eq. 12, Sec 5.3
Radio redshift	$\nu' = \nu \gamma_{\text{seg}}$	6 cm continuum detected	YES	Sec 5.4
Core mass	$M = (c^2/G) \int \gamma_{\text{seg}} dr$	$8.7 \pm 1.5 M_{\text{sun}}$	YES	Eq. 14, Sec 5.5
Molecular stability	$kT_{\text{local}} < E_{\text{bind}}$	NH3, CO detected	YES	Eq. 13, Sec 5.4