Figure 3: Input-to-State Stability Analysis

(a) Delay-Dependent Stability — ISS Margin $\kappa(\tau)$; Stability Boundary; Target Delay (150ms); Stable Region. X-axis: Communication Delay τ (ms). Y-axis: ISS Margin $\kappa(\tau)$.

(b) Frequency Response — $\tau = 50$ms; $\tau = 100$ms; $\tau = 150$ms; Safety Limit. X-axis: Time (s). Y-axis: Frequency Deviation Δf (Hz).

(c) Lyapunov Stability — $\tau=150$ms (Stable); $\tau=190$ms (Marginal); $\tau=210$ms (Unstable). X-axis: Time (s). Y-axis: Lyapunov Function $V(t)$.