Low Level Physics Benchmarks

Observables	Notes
Kinematic variable distributions/resolutions x, y, Q^2 for various methods	Different reconstruction methods are impacted more/less by different detector subsystems → Electron method (EEEMCAL, SVT), DA (SVT, FEMC, HCAL) etc
Input variable distributions/resolutions E_e, θ_e, Σ_h, $p_{t,h}$	Inputs to kinematic reconstruction methods → better resolution = better reconstruction
Σ_{total} distribution/resolution	Should peak at ~$2E_{e,beam}$ → important for reducing impact of QED ISR, beam-gas/physics backgrounds → better resolution = more veto power
$\Sigma_h/p_{t,h}$ distribution/resolution	Gives tan(γ) → quality of HFS angle measurement → important for DA reconstruction → insensitive to HFS energy resolution
$P_{t,h}/p_{t,e}$ distribution	Should peak at ~1 → sensitive to gaps in acceptance, low energy losses etc
dE/E vs θ/φ	Should be centred at dE/E ~0 → shows regions of poor reconstruction (e.g. transition between calorimeters)
E/p distribution/resolution for different charged particles	Important cut for electron finding
Electron purity	High purity requires efficient+precise electron reconstruction → important to ensure we're looking at actual DIS electrons
Electron finding efficiency (vs E_e, θ_e, φ_e)	High efficiency electron finding maximises statistics