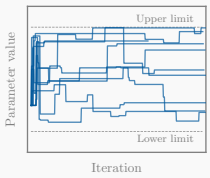
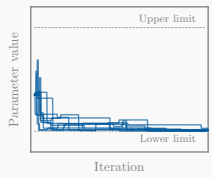
Check Parameter values



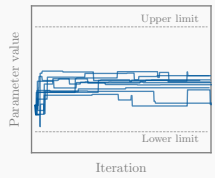
Problem
no consistent final value; spread entire range

parameter might be insensitive/not inferable with given data; consider sensitivity analysis to check



Problem
converges but against limit of parameter range

parameter range (here lower limit) might be too restricted; consider widening range

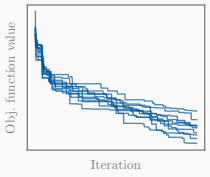


No Problem
all trials consistent; converge within parameter range

success

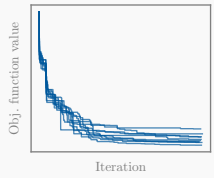
[used in Sect. 2.6]

Check Obj. function values – Single-objective –



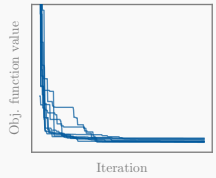
Problem
downward trend of each trial; no plateau

convergence criterion or budget used likely not appropriate; consider adjusting



Problem
trials converge but not to consistent value

increase budget or try another calibration algorithm; parameter ranges might be too wide

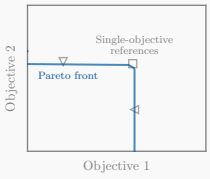


No Problem
all trials plateau; converge to similar values

success

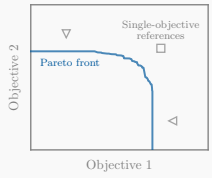
[used in Sect. 2.8]

Check Obj. function values – Multi-objective –



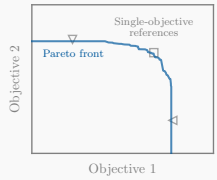
Problem
degenerated front (only visible when magnifying)

objectives are not independent; consider using only subset of objective functions



Problem
front not consistent with single-objective references

results not converged yet; increase budget or try another calibration algorithm

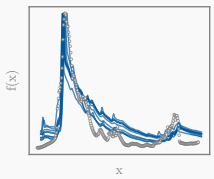


No Problem
front visible and consistent with single-objective references

success

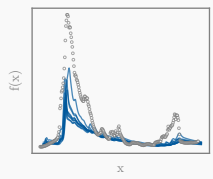
[used in Sect. 2.9]

Check Fit of simulations and observations



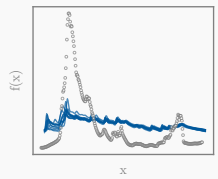
Problem?
fit favors high observation values

if this not desired, consider replacing, e.g., MSE with mean absolute error (MAE), or log-transform data



Problem?
fit favors low observation values

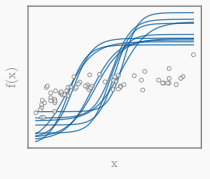
if this is not desired, consider higher weights for large y-values and errors (e.g., use MSE, not MAE)



Problem?
fit focuses on average behavior

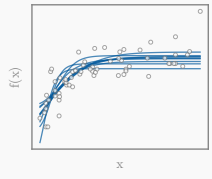
if this is not desired, consider weights for y-values or change objective function entirely

[used in Sect. 2.7]



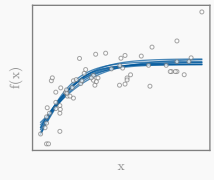
Problem
generally poor fit; wide spread of trials

parameter ranges might be too narrow; potentially consider revising model if ranges already wide



Problem
fit follows trend of data; wide spread of trials

parameter ranges too wide or budget for calibration too low; consider revising



No Problem
fit follows trend of data; narrow spread of trials

success

[used in Sect. 2.6]