Parameter Estimation in Nuclear Fission

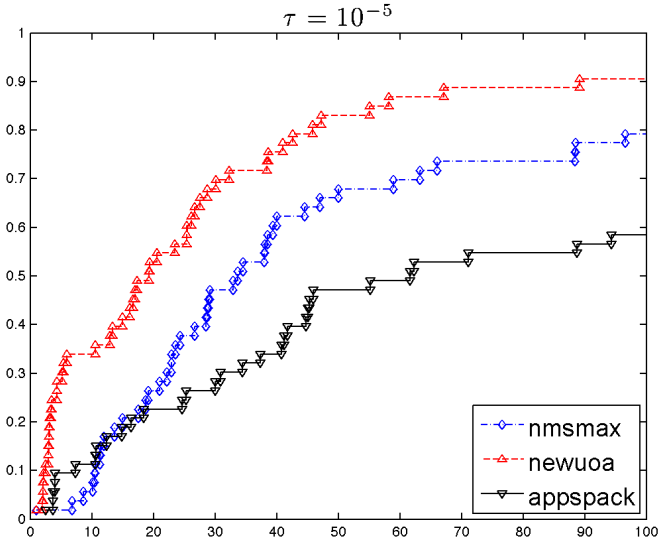
- $x \in \mathbb{R}^n$ is the vector of parameters
- m is the number of nuclei.
- $f_k(x)$ is the vector of observables for the k-th nucleus.
- y_k is the data vector associated with the k-th nucleus.

Proposal. Use a derivative-free method with

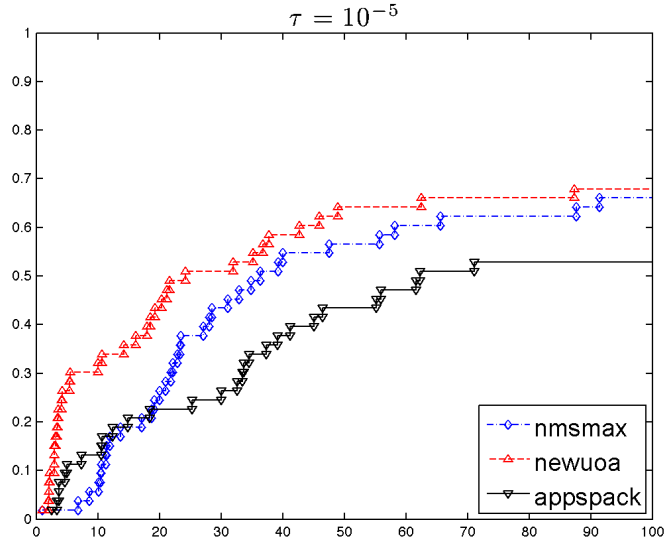
$$\mathcal{E}(x) = \sum_{k=1}^{m} \sigma_k \| f_k(x) - y_k \|_2^2,$$

where σ_k is a set of weights, to obtain the parameters.

Performance of Derivative-Free Methods



Smooth problems



Noisy problems

Convergence test: $f(x) \leq f(x^*) + \tau(f(x_0) - f(x^*))$

Reference: `www.mcs.anl.gov/~more/dfo`

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