

ILT

Mathematical Library for 1D and 2D Inverse Laplace Transform

This Library is able to rapidly compute an estimate of the Inverse Laplace Transform of a data-set acquired on regular or irregular grid.

It uses the Nonnegativity-constrained least squares code from J. Kim and H. Park, found in nnls.py (see details and reference therein).

ILT_1D.py is for 1D data-sets.

Given a set of N experimental points E_n , sampling at time T_n the evolution of a damping signal, following the Laplace law:

$$E_n = \sum_{m=1}^M \exp(-S_m T_n)$$

it solves the Laplace problem and computes an estimate \hat{S} of the Laplace spectrum S , assuming the positivity of the coefficients, by minimizing the least square estimate:

$$LS = \sum_{n=1}^N \left(E_n - \sum_{m=1}^M \exp(-\hat{S}_m T_n) \right)^2$$

It is a direct application of nnls.py

ILT_2D.py is for 2D data-sets, is a direct application of nnls.py