

# Appropriate smoothing by Savitzky-Golay approach

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Seven-point-Savitzky-Golay smoothing is applied to simulated X-ray spectra. In the present study, the sum of the two Lorentzian functions with the noise was used as spectral data. The noise was a normal random number with the standard deviation,  $\sqrt{I}$ , for the intensity  $I$  at each point in the spectrum. The residual sum of squares is plotted from 0 to 850 iterations for 7-point-Savitzky-Golay smoothing (sample size : 10 different seed points as the random noise).

[1] A. Savitzky, M.J.E Golay, Smoothing and differentiation of data by simplified least-squares procedures, *Anal. Chem.* 36 (8) (1964) 1627-1639.

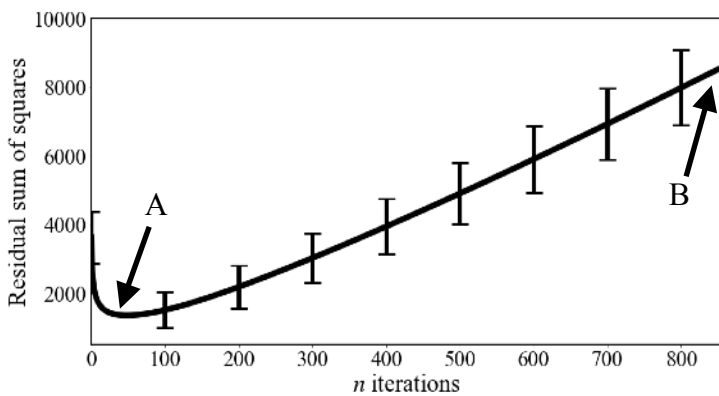


Fig. 1. The residual sum of squares plotted from 0 to 850 iterations for 7-point-Savitzky-Golay smoothing (sample size : 10 different seed points as the random noise), error bar : a square root of the unbiased variance of this

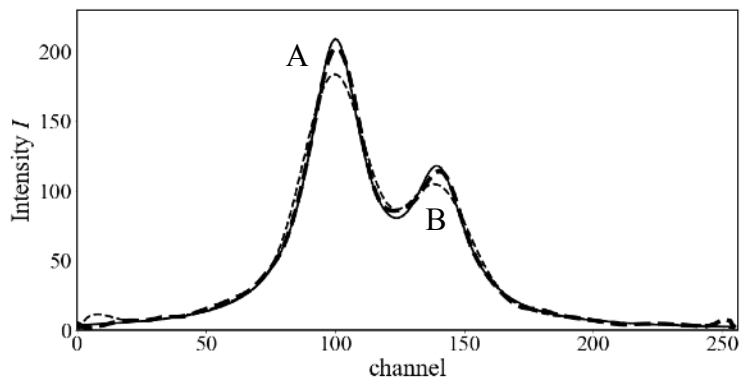


Fig. 2. The sum of the two Lorentzian functions (solid curve), A : appropriate smoothed data (thick broken curve,  $n=53$ ), B : excessive smoothed data (thin broken curve,  $n=850$ )