$h := 6.636\cdot10^{-34}\cdot m^2\cdot\frac{kg}{s}$ $\quad m_n := 1.675\cdot10^{-27}\cdot kg$ $\quad k_b := 1.38064852\cdot10^{-23}\cdot\frac{J}{K}$ $\quad eV := 1.60218\cdot10^{-19}\cdot J$

$$\eta(x) := \begin{vmatrix} 0 & \text{if } x < 0 \\ 1 & \text{otherwise} \end{vmatrix}$$

$\Sigma := 1.6\cdot cm^{-1}\cdot\left(10^{-6}\cdot sec\right)\cdot\sqrt{\frac{2\cdot eV}{m_n}}$ $\quad \Sigma = 2.213$ $\quad \beta := \frac{1}{24.1}$ $\quad R1 := 0.5$

$v(\varepsilon) := 10^{-6}\cdot sec\cdot\sqrt{\frac{2\cdot\varepsilon\cdot eV}{m_n}}$ $\quad v(100) = 0.138\, m$

$a_1 := 10$ $\quad \sigma_1 := 0.5$ $\quad v_1 := 10$ $\quad a_2 := 15$ $\quad \sigma_2 := 2$ $\quad x_2 := 25$

$a_3 := 10$ $\sigma_3 := 5$ $\quad x_3 := 35$

$$f(v) := \frac{a_1}{\sqrt{2\pi}\cdot\sigma_1}\cdot e^{-\left|\frac{(v-v_1)}{2\cdot\sigma_1}\right|} + \frac{a_2}{\sqrt{2\cdot\pi}\cdot\sigma_2}\cdot e^{\frac{-(v-x_2)^2}{2\cdot\sigma_2^{\,2}}} + \frac{a_3}{\sqrt{2\cdot\pi}\cdot\sigma_3}\cdot e^{\frac{-(v-x_3)^2}{2\cdot\sigma_3^{\,2}}}$$

$T := 200$ $\quad N_s := 600$ $\quad \Delta := \frac{T}{N_s - 1}$ $\quad L_2 := 180$

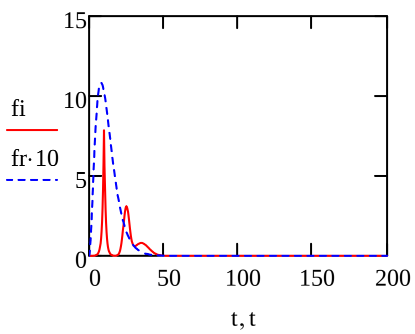
$i := 0 .. N_s - 1$ $\quad \tau_1 := 4$ $\quad \tau_2 := 0.1$

$t_i := i\cdot\Delta$

$fi_i := f(t_i)$

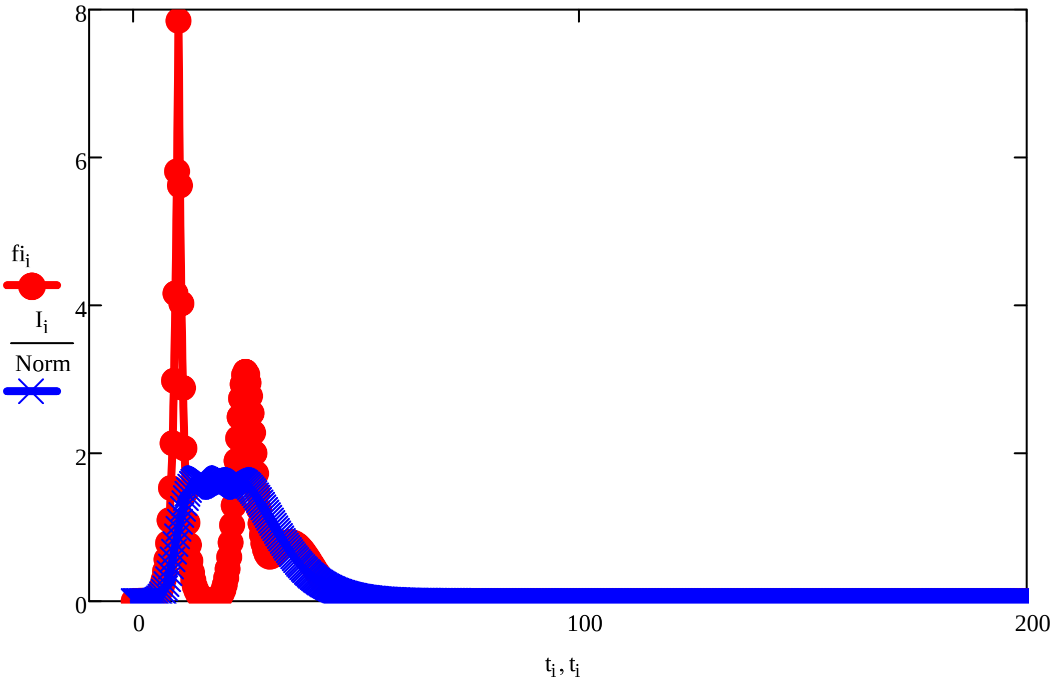
$$R(\tau) := \begin{vmatrix} \text{return } 0 \text{ if } \tau < 0 \\ \text{return } \tau^2\cdot\frac{e^{-\frac{\tau}{\tau_1}}}{\tau_1}\cdot\left[(1 - R1) + \frac{R1}{\tau_2 + \tau_1}\cdot e^{\frac{-\tau}{\tau_2}}\right] \text{ otherwise} \end{vmatrix}$$

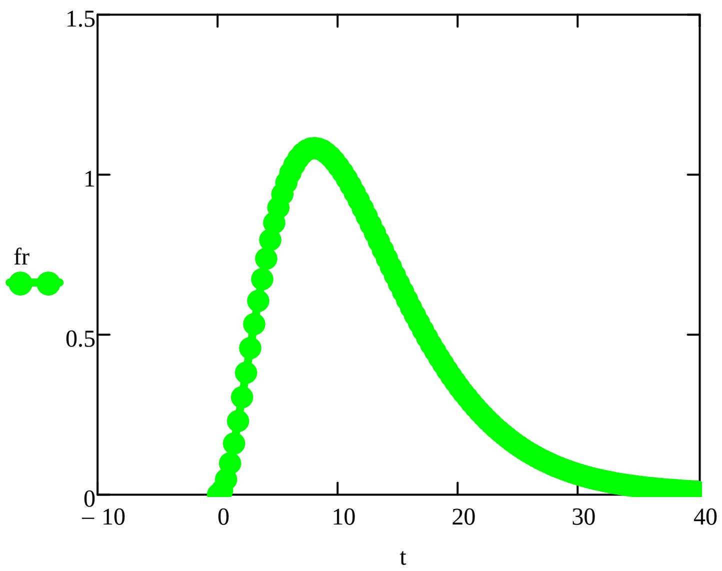
$fr_i := 1\cdot R(t_i)$ $\quad Norm := \int_0^{\infty} R(u)\, du$ $\quad Norm = 16$



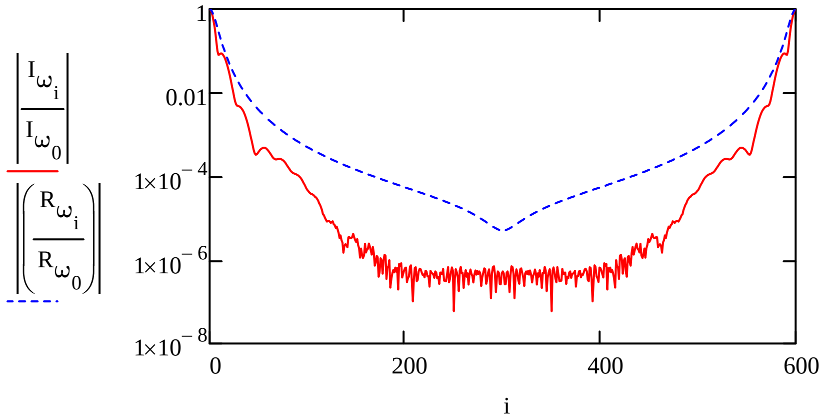
$$fm(x) := 1\cdot\left(\int_{0.001}^{v_1} f(u)\cdot R\left(x-\frac{L_2}{u}\right)du + \int_{v_1}^{v_1+3\cdot\sigma_1} f(u)\cdot R\left(x-\frac{L_2}{u}\right)du + \int_{v_1+3\cdot\sigma_1}^{x_2} f(u)\cdot R\left(x-\frac{L_2}{u}\right)du + \int_{x_2}^{x_3} f(u)\cdot R\left(x-\frac{L_2}{u}\right.\right.$$

$I_i := fm(t_i)$ $\qquad$ $I_{tot} := \Delta\cdot\sum_i I_i$ $\qquad$ $I_{tot} = 655.309$ $\qquad$ $\Delta\cdot\sum_i fr_i = 16$





$I_{\omega} := \mathrm{cfft}(I)$ $\qquad$ $R_{\omega} := \mathrm{cfft}(fr)$



$I_{\omega_0} = 80.125$

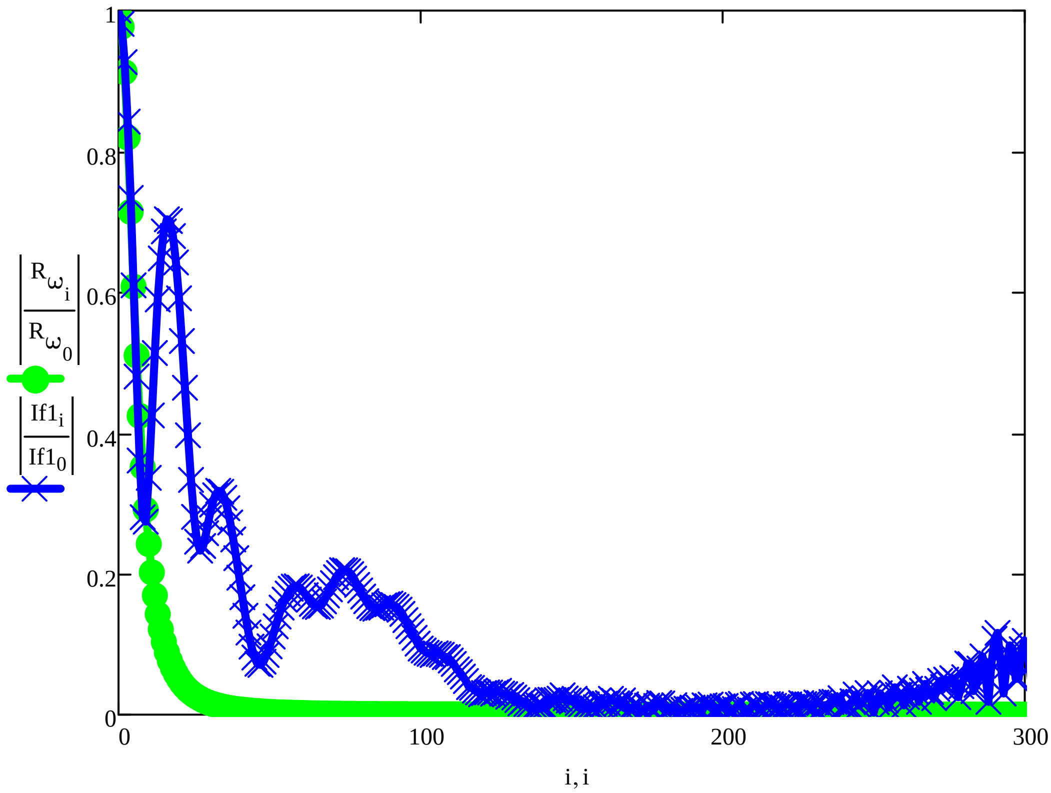
$R_{\omega_0} = 1.956$

high frequency filter for spectra: $\quad \mathrm{if}\left(\left|n - 50\right| < 40, 0, D_n\right)$

$\varepsilon_{Res} := 10^{-9}$

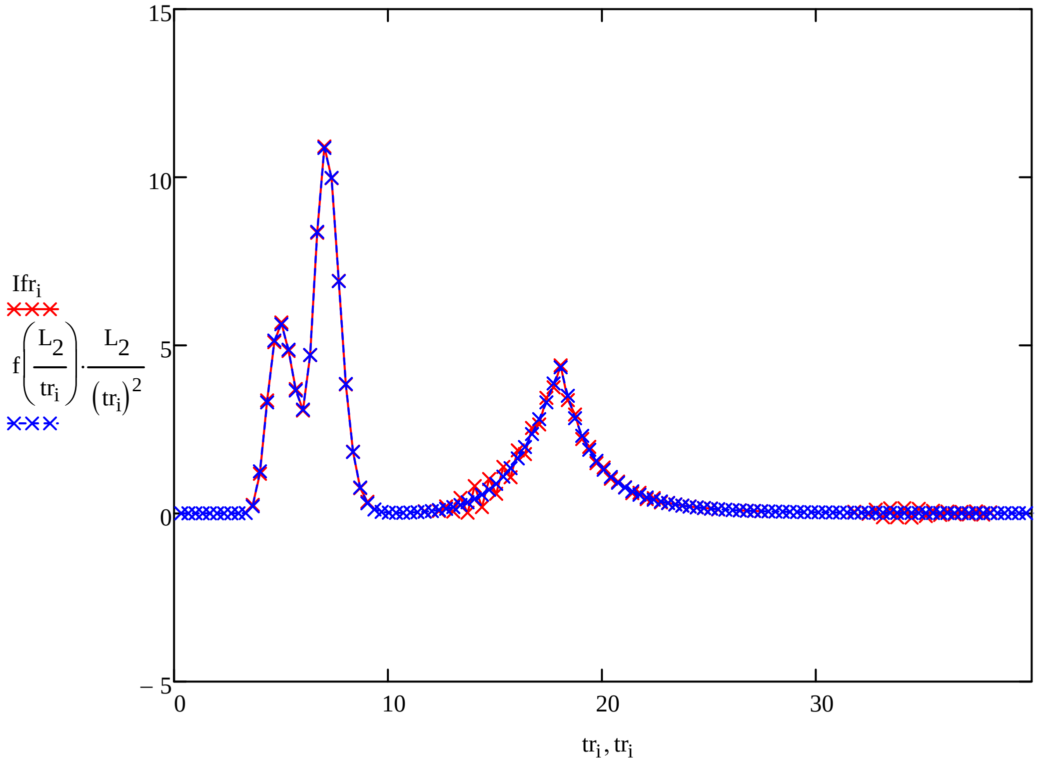
$$\mathrm{filt}(I, R, Nf) := \left| \begin{array}{l} np \leftarrow \mathrm{length}(I) \\ cent \leftarrow \dfrac{np}{2} \\ \text{for } i \in 0..np-1 \\ \quad \left| \begin{array}{l} rez_i \leftarrow 0 \;\; \text{if } \left|i - cent\right| < Nf \\ \text{otherwise} \\ \quad \left| \begin{array}{l} rez_i \leftarrow 0 \;\; \text{if } \left|R_i\right| < \varepsilon_{Res} \\ rez_i \leftarrow \dfrac{I_i}{R_i + \varepsilon_{Res}} \;\; \text{otherwise} \end{array} \right. \end{array} \right. \end{array} \right.$$

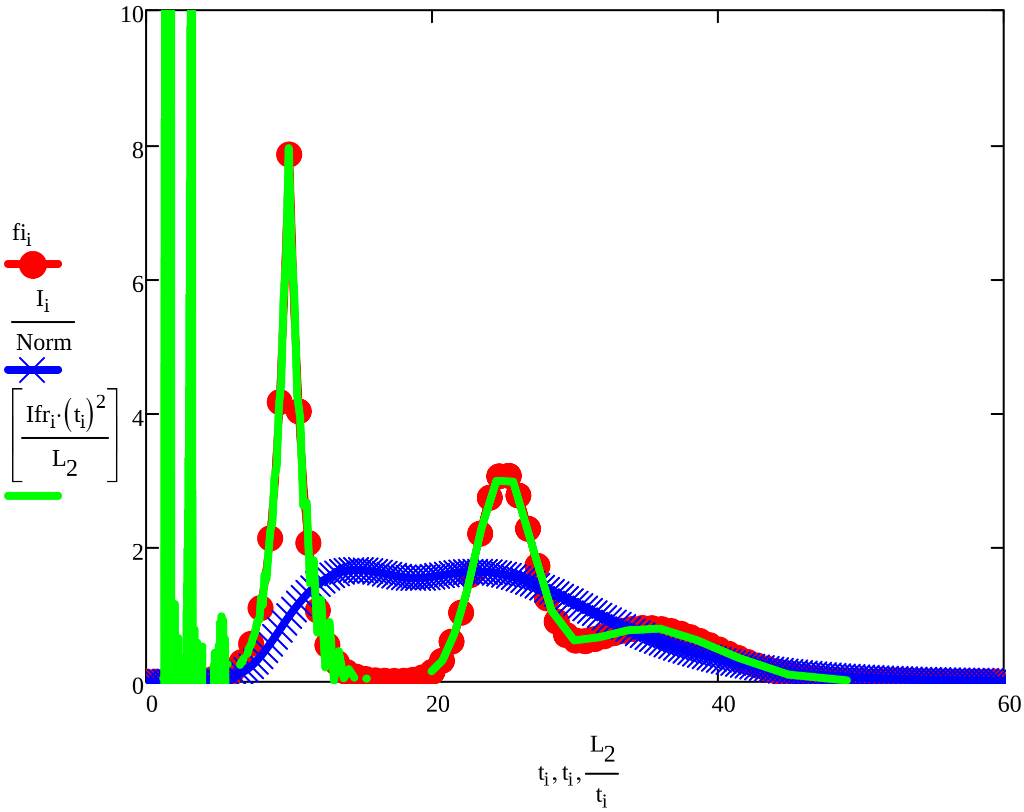
$If1 := \mathrm{filt}\left(I_{\omega}, R_{\omega}, 0\right)$



$$\Delta_\tau := \frac{\pi}{N_s - 1}$$

$$Ifr := \frac{1}{\Delta \cdot \sqrt{N_s}} \cdot \mathrm{icfft}(If1) \qquad \tau_i := \frac{-\pi}{2} + \Delta_\tau \cdot i \qquad tr_i := \left(\tau_i + \frac{\pi}{2}\right) \cdot \frac{T}{\pi}$$





$$\left.\Big)\,du + \int_{x_3}^{\infty} f(u)\cdot R\left(x - \frac{L_2}{u}\right) du\right)$$