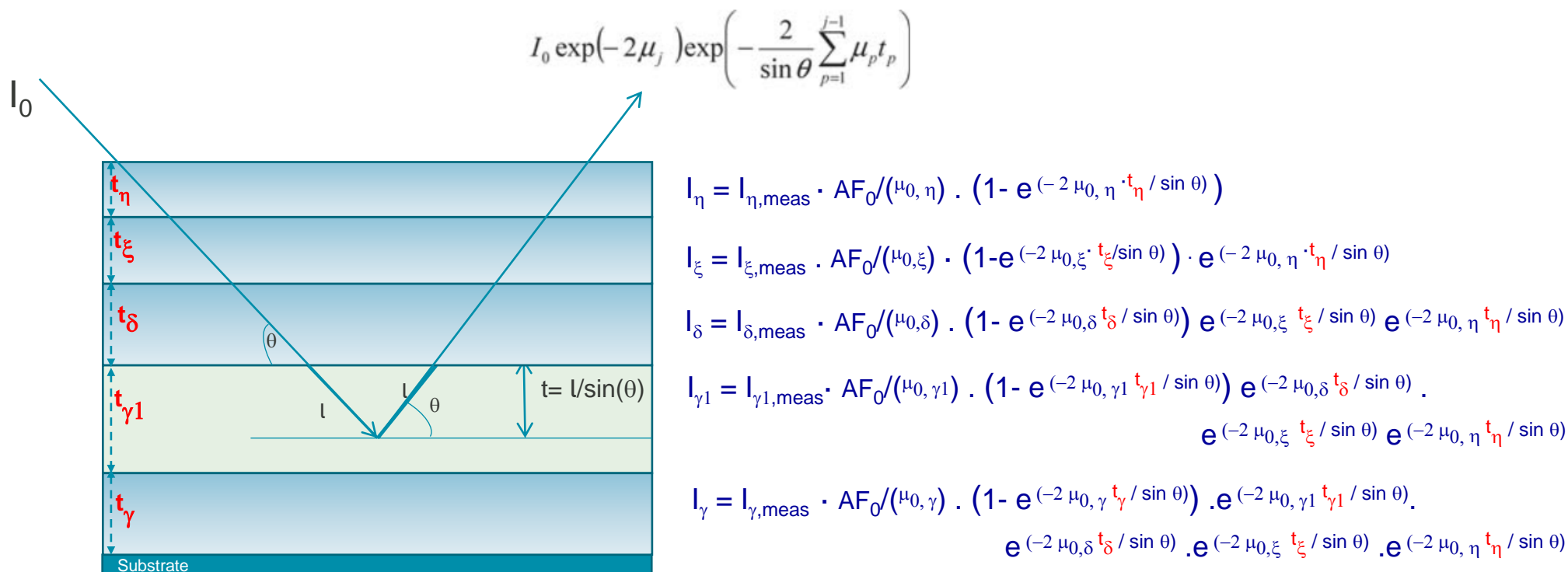# SIMPLE CALCULATION FOR LAYERS
Implemented explicit forms

Intensity corrections for the layered structure related scales and other correction factors

$$I_0 \exp(-2\mu_j)\exp\left(-\frac{2}{\sin\theta}\sum_{p=1}^{j-1}\mu_p t_p\right)$$

$I_\eta = I_{\eta,meas} \cdot AF_0/(\mu_{0,\eta}) \cdot (1 - e^{(-2\mu_{0,\eta} \cdot t_\eta / \sin\theta)})$

$I_\xi = I_{\xi,meas} \cdot AF_0/(\mu_{0,\xi}) \cdot (1 - e^{(-2\mu_{0,\xi} \cdot t_\xi/\sin\theta)}) \cdot e^{(-2\mu_{0,\eta} \cdot t_\eta / \sin\theta)}$

$I_\delta = I_{\delta,meas} \cdot AF_0/(\mu_{0,\delta}) \cdot (1 - e^{(-2\mu_{0,\delta} t_\delta / \sin\theta)}) e^{(-2\mu_{0,\xi} t_\xi / \sin\theta)} e^{(-2\mu_{0,\eta} t_\eta / \sin\theta)}$

$I_{\gamma 1} = I_{\gamma 1,meas} \cdot AF_0/(\mu_{0,\gamma 1}) \cdot (1 - e^{(-2\mu_{0,\gamma 1} t_{\gamma 1} / \sin\theta)}) e^{(-2\mu_{0,\delta} t_\delta / \sin\theta)} \cdot$
$e^{(-2\mu_{0,\xi} t_\xi / \sin\theta)} e^{(-2\mu_{0,\eta} t_\eta / \sin\theta)}$

$I_\gamma = I_{\gamma,meas} \cdot AF_0/(\mu_{0,\gamma}) \cdot (1 - e^{(-2\mu_{0,\gamma} t_\gamma / \sin\theta)}) \cdot e^{(-2\mu_{0,\gamma 1} t_{\gamma 1} / \sin\theta)} \cdot$
$e^{(-2\mu_{0,\delta} t_\delta / \sin\theta)} \cdot e^{(-2\mu_{0,\xi} t_\xi / \sin\theta)} \cdot e^{(-2\mu_{0,\eta} t_\eta / \sin\theta)}$
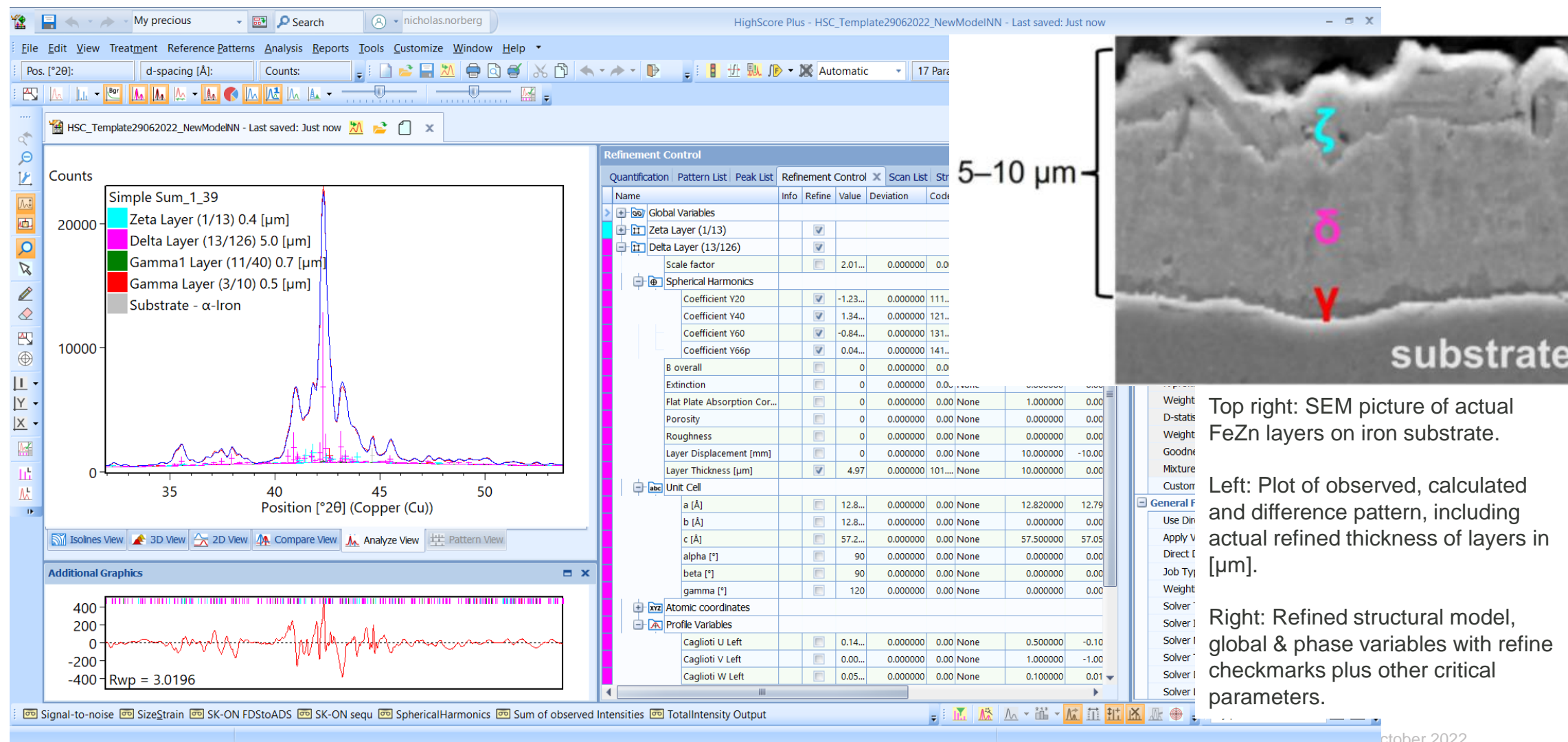
where, t_k : refinable parameters

$\mu_{0,}$: Linear absorption coeffient [cm^{-1}]

and AF_0 : a supplied constant (depending on the instrument)

IMPLEMENTATION IN HIGHSCORE V5.2

Determination of layer thickness & many other parameters from XRD data

Top right: SEM picture of actual FeZn layers on iron substrate.

Left: Plot of observed, calculated and difference pattern, including actual refined thickness of layers in [μm].

Right: Refined structural model, global & phase variables with refine checkmarks plus other critical parameters.