$\text{sigma[x\_]} = ((2*(\text{muz}+gx)*\text{nu})/(K*(\text{nu}+\text{muz}+gx)))\text{\textasciicircum}0.5$

$f[\text{x\_}] = (Tx/(2*(\text{nu}+\text{muz}+gx)))+$

T

$(((2/(K*\text{nu}))\text{\textasciicircum}0.5)*((\text{muz}+gx)\text{\textasciicircum}1.5/(\text{muz}+\text{nu}+gx)\text{\textasciicircum}0.5)*$

$((\sinh[x/\text{sigma}[x]])/(\cosh[L/\text{sigma}[x]])))/(\text{muz}+\text{nu}+gx)$

$f'[\text{x\_}]$

$f"[\text{x\_}]$

$1.41421\left(\frac{\text{nu}(\text{muz}+gx)}{K(\text{muz}+\text{nu}+gx)}\right)^{0.5}$

$$\frac{Tx}{2(\text{muz}+\text{nu}+gx)} + \frac{1.41421\left(\frac{1}{K\text{nu}}\right)^{0.5}T(\text{muz}+gx)^{1.5}\sinh\left[\frac{0.707107x}{\left(\frac{\text{nu}(\text{muz}+gx)}{K(\text{muz}+\text{nu}+gx)}\right)^{0.5}}\right]}{(\text{muz}+\text{nu}+gx)^{1.5}\cosh\left[\frac{0.707107L}{\left(\frac{\text{nu}(\text{muz}+gx)}{K(\text{muz}+\text{nu}+gx)}\right)^{0.5}}\right]}$$

$$-\frac{gT\text{x\_}}{2(\text{muz}+\text{nu}+g\text{x\_})^2}+\frac{T}{2(\text{muz}+\text{nu}+g\text{x\_})}-\frac{2.12132g\left(\frac{1}{K\text{nu}}\right)^{0.5}T(\text{muz}+g\text{x\_})^{1.5}\sinh\left[\frac{0.707107\text{x\_}}{\left(\frac{\text{nu}(\text{muz}+g\text{x\_})}{K(\text{muz}+\text{nu}+g\text{x\_})}\right)^{0.5}}\right]}{\cosh\left[\frac{0.707107L}{\left(\frac{\text{nu}(\text{muz}+g\text{x\_})}{K(\text{muz}+\text{nu}+g\text{x\_})}\right)^{0.5}}\right](\text{muz}+\text{nu}+g\text{x\_})^{2.5}}+$$

$$\frac{2.12132g\left(\frac{1}{K\text{nu}}\right)^{0.5}T(\text{muz}+g\text{x\_})^{0.5}\sinh\left[\frac{0.707107\text{x\_}}{\left(\frac{\text{nu}(\text{muz}+g\text{x\_})}{K(\text{muz}+\text{nu}+g\text{x\_})}\right)^{0.5}}\right]}{\cosh\left[\frac{0.707107L}{\left(\frac{\text{nu}(\text{muz}+g\text{x\_})}{K(\text{muz}+\text{nu}+g\text{x\_})}\right)^{0.5}}\right](\text{muz}+\text{nu}+g\text{x\_})^{1.5}}+\left(0.5L\left(\frac{1}{K\text{nu}}\right)^{0.5}T(\text{muz}+g\text{x\_})^{1.5}\left(-\frac{g\text{nu}(\text{muz}+g\text{x\_})}{K(\text{muz}+\text{nu}+g\text{x\_})^2}+\frac{}{K(\text{mu}}\right.\right.$$

$$\left(1.41421\left(\frac{1}{K\text{nu}}\right)^{0.5}T(\text{muz}+g\text{x\_})^{1.5}\left(\frac{0.707107}{\left(\frac{\text{nu}(\text{muz}+g\text{x\_})}{K(\text{muz}+\text{nu}+g\text{x\_})}\right)^{0.5}}-\frac{0.353553\text{x\_}\left(-\frac{g\text{nu}(\text{muz}+g\text{x\_})}{K(\text{muz}+\text{nu}+g\text{x\_})^2}+\frac{g\text{nu}}{K(\text{muz}+\text{nu}+g\text{x\_})}\right)}{\left(\frac{\text{nu}(\text{muz}+g\text{x\_})}{K(\text{muz}+\text{nu}+g\text{x\_})}\right)^{1.5}}\right)\sinh'\left[\frac{0.}{\left(\frac{\text{nu}(}{K(\text{mu}}\right.\right.$$

$$\frac{g^2T\text{x\_}}{(\text{muz}+\text{nu}+g\text{x\_})^3}-\frac{gT}{(\text{muz}+\text{nu}+g\text{x\_})^2}+\frac{5.3033g^2\left(\frac{1}{K\text{nu}}\right)^{0.5}T(\text{muz}+g\text{x\_})^{1.5}\sinh\left[\frac{0.707107\text{x\_}}{\left(\frac{\text{nu}(\text{muz}+g\text{x\_})}{K(\text{muz}+\text{nu}+g\text{x\_})}\right)^{0.5}}\right]}{\cosh\left[\frac{0.707107L}{\left(\frac{\text{nu}(\text{muz}+g\text{x\_})}{K(\text{muz}+\text{nu}+g\text{x\_})}\right)^{0.5}}\right](\text{muz}+\text{nu}+g\text{x\_})^{3.5}}-$$

$$\frac{6.36396g^2\left(\frac{1}{K\text{nu}}\right)^{0.5}T(\text{muz}+g\text{x\_})^{0.5}\sinh\left[\frac{0.707107\text{x\_}}{\left(\frac{\text{nu}(\text{muz}+g\text{x\_})}{K(\text{muz}+\text{nu}+g\text{x\_})}\right)^{0.5}}\right]}{\cosh\left[\frac{0.707107L}{\left(\frac{\text{nu}(\text{muz}+g\text{x\_})}{K(\text{muz}+\text{nu}+g\text{x\_})}\right)^{0.5}}\right](\text{muz}+\text{nu}+g\text{x\_})^{2.5}}+\frac{1.06066g^2\left(\frac{1}{K\text{nu}}\right)^{0.5}T\sinh\left[\frac{0.707107\text{x\_}}{\left(\frac{\text{nu}(\text{muz}+g\text{x\_})}{K(\text{muz}+\text{nu}+g\text{x\_})}\right)^{0.5}}\right]}{\cosh\left[\frac{0.707107L}{\left(\frac{\text{nu}(\text{muz}+g\text{x\_})}{K(\text{muz}+\text{nu}+g\text{x\_})}\right)^{0.5}}\right](\text{muz}+g\text{x\_})^{0.5}(\text{muz}+\text{nu}+g\text{x\_})^{1.5}}+$$

$$\left(0.5L\left(\frac{1}{K\text{nu}}\right)^{0.5}T(\text{muz}+g\text{x\_})^{1.5}\left(\frac{2g^2\text{nu}(\text{muz}+g\text{x\_})}{K(\text{muz}+\text{nu}+g\text{x\_})^3}-\frac{2g^2\text{nu}}{K(\text{muz}+\text{nu}+g\text{x\_})^2}\right)\sinh\left[\frac{0.707107\text{x\_}}{\left(\frac{\text{nu}(\text{muz}+g\text{x\_})}{K(\text{muz}+\text{nu}+g\text{x\_})}\right)^{0.5}}\right]\cosh'\left[\frac{0.707107}{\left(\frac{\text{nu}(\text{muz}+g\text{x\_}}{K(\text{muz}+\text{nu}+g}\right.\right.$$

$$\left(1.5gL\left(\frac{1}{K\text{nu}}\right)^{0.5}T(\text{muz}+g\text{x\_})^{1.5}\left(-\frac{g\text{nu}(\text{muz}+g\text{x\_})}{K(\text{muz}+\text{nu}+g\text{x\_})^2}+\frac{g\text{nu}}{K(\text{muz}+\text{nu}+g\text{x\_})}\right)\sinh\left[\frac{0.707107\text{x\_}}{\left(\frac{\text{nu}(\text{muz}+g\text{x\_})}{K(\text{muz}+\text{nu}+g\text{x\_})}\right)^{0.5}}\right]\cosh'\left[\frac{0.7071}{\left(\frac{\text{nu}(\text{muz}+}{K(\text{muz}+\text{nu}}\right.\right.$$

$$\left(1.5gL\left(\frac{1}{K\text{nu}}\right)^{0.5}T(\text{muz}+g\text{x\_})^{0.5}\left(-\frac{g\text{nu}(\text{muz}+g\text{x\_})}{K(\text{muz}+\text{nu}+g\text{x\_})^2}+\frac{g\text{nu}}{K(\text{muz}+\text{nu}+g\text{x\_})}\right)\sinh\left[\frac{0.707107\text{x\_}}{\left(\frac{\text{nu}(\text{muz}+g\text{x\_})}{K(\text{muz}+\text{nu}+g\text{x\_})}\right)^{0.5}}\right]\cosh'\left[\frac{0.7071}{\left(\frac{\text{nu}(\text{muz}+}{K(\text{muz}+\text{nu}}\right.\right.$$

$$\left(0.75L\left(\frac{1}{K\text{nu}}\right)^{0.5}T(\text{muz}+g\text{x\_})^{1.5}\left(-\frac{g\text{nu}(\text{muz}+g\text{x\_})}{K(\text{muz}+\text{nu}+g\text{x\_})^2}+\frac{g\text{nu}}{K(\text{muz}+\text{nu}+g\text{x\_})}\right)^2\sinh\left[\frac{0.707107\text{x\_}}{\left(\frac{\text{nu}(\text{muz}+g\text{x\_})}{K(\text{muz}+\text{nu}+g\text{x\_})}\right)^{0.5}}\right]\cosh'\left[\frac{0.70}{\left(\frac{\text{nu}(\text{muz}}{K(\text{muz}+}\right.\right.$$

$$\left(0.353553 L^2 \left(\frac{1}{K\mathrm{nu}}\right)^{0.5} T(\mathrm{muz}+g\mathrm{x}_-)^{1.5}\left(-\frac{g\mathrm{nu}(\mathrm{muz}+g\mathrm{x}_-)}{K(\mathrm{muz}+\mathrm{nu}+g\mathrm{x}_-)^2}+\frac{g\mathrm{nu}}{K(\mathrm{muz}+\mathrm{nu}+g\mathrm{x}_-)}\right)^2 \sinh\left[\frac{0.707107\mathrm{x}_-}{\left(\frac{\mathrm{nu}(\mathrm{muz}+g\mathrm{x}_-)}{K(\mathrm{muz}+\mathrm{nu}+g\mathrm{x}_-)}\right)^{0.5}}\right]\cosh'\left[\frac{}{(}\right.\right.$$

$$\left(4.24264 g \left(\frac{1}{K\mathrm{nu}}\right)^{0.5} T(\mathrm{muz}+g\mathrm{x}_-)^{1.5}\left(\frac{0.707107}{\left(\frac{\mathrm{nu}(\mathrm{muz}+g\mathrm{x}_-)}{K(\mathrm{muz}+\mathrm{nu}+g\mathrm{x}_-)}\right)^{0.5}}-\frac{0.353553\mathrm{x}_-\left(-\frac{g\mathrm{nu}(\mathrm{muz}+g\mathrm{x}_-)}{K(\mathrm{muz}+\mathrm{nu}+g\mathrm{x}_-)^2}+\frac{g\mathrm{nu}}{K(\mathrm{muz}+\mathrm{nu}+g\mathrm{x}_-)}\right)}{\left(\frac{\mathrm{nu}(\mathrm{muz}+g\mathrm{x}_-)}{K(\mathrm{muz}+\mathrm{nu}+g\mathrm{x}_-)}\right)^{1.5}}\right)\sinh'\left[\frac{}{\left(\frac{\mathrm{nu}}{K(\mathrm{n}}\right.}\right.\right.$$

$$\left(4.24264 g \left(\frac{1}{K\mathrm{nu}}\right)^{0.5} T(\mathrm{muz}+g\mathrm{x}_-)^{0.5}\left(\frac{0.707107}{\left(\frac{\mathrm{nu}(\mathrm{muz}+g\mathrm{x}_-)}{K(\mathrm{muz}+\mathrm{nu}+g\mathrm{x}_-)}\right)^{0.5}}-\frac{0.353553\mathrm{x}_-\left(-\frac{g\mathrm{nu}(\mathrm{muz}+g\mathrm{x}_-)}{K(\mathrm{muz}+\mathrm{nu}+g\mathrm{x}_-)^2}+\frac{g\mathrm{nu}}{K(\mathrm{muz}+\mathrm{nu}+g\mathrm{x}_-)}\right)}{\left(\frac{\mathrm{nu}(\mathrm{muz}+g\mathrm{x}_-)}{K(\mathrm{muz}+\mathrm{nu}+g\mathrm{x}_-)}\right)^{1.5}}\right)\sinh'\left[\frac{}{\left(\frac{\mathrm{nu}}{K(\mathrm{n}}\right.}\right.\right.$$

$$\left(1.41421 \left(\frac{1}{K\mathrm{nu}}\right)^{0.5} T(\mathrm{muz}+g\mathrm{x}_-)^{1.5}\left(-\frac{0.353553\mathrm{x}_-\left(\frac{2g^2\mathrm{nu}(\mathrm{muz}+g\mathrm{x}_-)}{K(\mathrm{muz}+\mathrm{nu}+g\mathrm{x}_-)^3}-\frac{2g^2\mathrm{nu}}{K(\mathrm{muz}+\mathrm{nu}+g\mathrm{x}_-)^2}\right)}{\left(\frac{\mathrm{nu}(\mathrm{muz}+g\mathrm{x}_-)}{K(\mathrm{muz}+\mathrm{nu}+g\mathrm{x}_-)}\right)^{1.5}}-\frac{0.707107\left(-\frac{g\mathrm{nu}(\mathrm{muz}+g\mathrm{x}_-)}{K(\mathrm{muz}+\mathrm{nu}+g\mathrm{x}_-)^2}+\frac{g\mathrm{nu}}{K(\mathrm{mu}}\right)}{\left(\frac{\mathrm{nu}(\mathrm{muz}+g\mathrm{x}_-)}{K(\mathrm{muz}+\mathrm{nu}+g\mathrm{x}_-)}\right)^{1.5}}\right.\right.$$

$$\left(1. L \left(\frac{1}{K\mathrm{nu}}\right)^{0.5} T(\mathrm{muz}+g\mathrm{x}_-)^{1.5}\left(-\frac{g\mathrm{nu}(\mathrm{muz}+g\mathrm{x}_-)}{K(\mathrm{muz}+\mathrm{nu}+g\mathrm{x}_-)^2}+\frac{g\mathrm{nu}}{K(\mathrm{muz}+\mathrm{nu}+g\mathrm{x}_-)}\right)\left(\frac{0.707107}{\left(\frac{\mathrm{nu}(\mathrm{muz}+g\mathrm{x}_-)}{K(\mathrm{muz}+\mathrm{nu}+g\mathrm{x}_-)}\right)^{0.5}}-\frac{0.353553\mathrm{x}_-\left(-\frac{g\mathrm{nu}(\mathrm{muz}+g}{K(\mathrm{muz}+\mathrm{nu}+}\right)}{\left(\frac{\mathrm{nu}(\mathrm{muz}+}{K(\mathrm{muz}+\mathrm{nu}}\right)}\right.\right.$$

$$\left(0.176777 L^2 \left(\frac{1}{K\mathrm{nu}}\right)^{0.5} T(\mathrm{muz}+g\mathrm{x}_-)^{1.5}\left(-\frac{g\mathrm{nu}(\mathrm{muz}+g\mathrm{x}_-)}{K(\mathrm{muz}+\mathrm{nu}+g\mathrm{x}_-)^2}+\frac{g\mathrm{nu}}{K(\mathrm{muz}+\mathrm{nu}+g\mathrm{x}_-)}\right)^2 \sinh\left[\frac{0.707107\mathrm{x}_-}{\left(\frac{\mathrm{nu}(\mathrm{muz}+g\mathrm{x}_-)}{K(\mathrm{muz}+\mathrm{nu}+g\mathrm{x}_-)}\right)^{0.5}}\right]\cosh''\left[\frac{}{(}\right.\right.$$

$$\left(1.41421 \left(\frac{1}{K\mathrm{nu}}\right)^{0.5} T(\mathrm{muz}+g\mathrm{x}_-)^{1.5}\left(\frac{0.707107}{\left(\frac{\mathrm{nu}(\mathrm{muz}+g\mathrm{x}_-)}{K(\mathrm{muz}+\mathrm{nu}+g\mathrm{x}_-)}\right)^{0.5}}-\frac{0.353553\mathrm{x}_-\left(-\frac{g\mathrm{nu}(\mathrm{muz}+g\mathrm{x}_-)}{K(\mathrm{muz}+\mathrm{nu}+g\mathrm{x}_-)^2}+\frac{g\mathrm{nu}}{K(\mathrm{muz}+\mathrm{nu}+g\mathrm{x}_-)}\right)}{\left(\frac{\mathrm{nu}(\mathrm{muz}+g\mathrm{x}_-)}{K(\mathrm{muz}+\mathrm{nu}+g\mathrm{x}_-)}\right)^{1.5}}\right)^2 \sinh''\left[\frac{}{\left(\frac{\mathrm{n}}{K(}\right.}\right.\right.$$