TEST PROFILES FOR SYNTHETIC DATA SETS

- Electrical conductivity profiles.

  Model function for the electrical conductivity as a function of depth z measured in meters. In all profiles θ and m are parameters to be chosen.

  Gaussian:

  $$\sigma_{\theta,m}(z) = \theta \mathrm{e}^{-(z-z_0)^2} + m.$$

  In this case, the conductivity takes values in $[m, \theta + m]$ and has a maximum in $z = z_0$.

  Triangular:

  $$\sigma_{\theta,m}(z) = \begin{cases} \frac{1}{z_0}(\theta - m)z + \theta, & \text{if} \quad z \in [0, z_0] \\ (\theta - m)e^{-(z-z_0)} + \theta, & \text{if} \quad z \in (z_0, \infty) \end{cases}$$

  In this case, the conductivity takes values in $[m, \theta]$ and has a maximum in $z = z_0$.

  Piecewise constant:

  $$\sigma_{\theta,m}(z) = \begin{cases} m, & \text{if} \quad z \leq a \\ \theta, & \text{if} \quad a < z < b \\ m, & \text{if} \quad z \geq b \end{cases}$$

  In this case, the conductivity takes values in $[m, \theta]$ and has a maximum in $[a, b]$.

- Magnetic susceptibility profiles

  Model function for the magnetic permeability as a function of depth z measured in meters. In all profiles θ and m are parameters to be chosen.

  Gaussian:

  $$\mu_{\theta,m}(z) = \theta \mathrm{e}^{-(z-z_0)^2} + m.$$

  In this case, the susceptibility takes values in $[m, \theta + m]$ and has a maximum in $z = z_0$.

  Triangular:

  $$\mu_{\theta,m}(z) = \begin{cases} \frac{1}{z_0}(\theta - m)z + \theta, & \text{if} \quad z \in [0, z_0] \\ (\theta - m)e^{-(z-z_0)} + \theta, & \text{if} \quad z \in (z_0, \infty) \end{cases}$$

  In this case, the susceptibility takes values in $[m, \theta]$ and has a maximum in $z = z_0$.

  Piecewise constant:

  $$\mu_{\theta,m}(z) = \begin{cases} m, & \text{if} \quad z \leq a \\ \theta, & \text{if} \quad a < z < b \\ m, & \text{if} \quad z \geq b \end{cases}$$

  In this case, the susceptibility takes values in $[m, \theta]$ and has a maximum in $[a, b]$.