Multivariate Normal Distribution for SOM

$$\boldsymbol{\delta} \leftarrow \mathcal{N}(\boldsymbol{\mu}, \mathtt{C})$$

$\boldsymbol{\mu} = [0.000,\ 0.002,\ 0.013,\ 0.011,\ -0.006]$

$$\mathtt{C} = 10^{-6} \begin{pmatrix} 91.219 & 16.472 & 11.410 & 0.152 & 4.946 \\ 16.472 & 128.971 & 41.094 & -16.667 & -1.786 \\ 11.41 & 41.094 & 133.68 & -9.868 & -1.869 \\ 0.152 & -16.67 & -9.868 & 70.93 & 27.545 \\ 4.946 & -1.786 & -1.869 & 27.545 & 94.224 \end{pmatrix}$$

KiDS-1000 Likelihood

$$\boldsymbol{x} \leftarrow \mathcal{U}[-5, 5]$$

Initialised at $\boldsymbol{x}_{\mathrm{centre}} = [0.000,\ 0.181,\ 1.110,\ 1.395,\ -1.265]$

$\mathtt{C} = \mathtt{L}\mathtt{L}^{\mathrm{T}}$

$\mathtt{L}\boldsymbol{x}_{\mathrm{centre}} = [0.000,\ 0.002,\ 0.013,\ 0.011,\ -0.007]$

$\mathtt{L}\boldsymbol{x}_{\mathrm{min}} = -[0.048,\ 0.065,\ 0.078,\ 0.032,\ 0.063]$

$\mathtt{L}\boldsymbol{x}_{\mathrm{max}} = [0.048,\ 0.065,\ 0.078,\ 0.032,\ 0.063]$

At every step in the sampling procedure, they then calculate the shifts as $\boldsymbol{\delta} = \mathtt{L}\boldsymbol{x}$. Once we have samples for $\boldsymbol{x}$, we would then use $\mathtt{L}$ to get samples of $\boldsymbol{\delta}$. But this is not the same as sampling from a multivariate normal distribution because we need the calculation of the pdf to calculate the log-posterior.