Subject parameter distribution:

$$\underbrace{\begin{bmatrix}\text{t0\_stress}_i\\ \text{t0\_quality}_i\\ \text{mi\_stress}_i\\ \text{mi\_quality}_i\end{bmatrix}}_{\boldsymbol{\phi}(i)} \sim \text{tform}\left\{\text{N}\left(\begin{bmatrix}\text{raw\_t0\_stress}\\ \text{raw\_t0\_quality}\\ \text{raw\_mi\_stress}\\ \text{raw\_mi\_quality}\end{bmatrix}, \begin{bmatrix}\text{rawPCov\_1\_1} & \text{rawPCov\_2\_1} & \text{rawPCov\_3\_1} & \text{rawPCov\_4\_1}\\ \text{rawPCov\_2\_1} & \text{rawPCov\_2\_2} & \text{rawPCov\_3\_2} & \text{rawPCov\_4\_2}\\ \text{rawPCov\_3\_1} & \text{rawPCov\_3\_2} & \text{rawPCov\_3\_3} & \text{rawPCov\_4\_3}\\ \text{rawPCov\_4\_1} & \text{rawPCov\_4\_2} & \text{rawPCov\_4\_3} & \text{rawPCov\_4\_4}\end{bmatrix}\right)\right\}$$

Initial latent state:

$$\underbrace{\begin{bmatrix}\text{Stress}\\ \text{Quality}\end{bmatrix}(t_0)}_{\boldsymbol{\eta}(t_0)} \sim \text{N}\left(\underbrace{\begin{bmatrix}\text{t0\_stress}\\ \text{t0\_quality}\end{bmatrix}}_{\text{T0MEANS}}, \underbrace{UcorSDtoCov\left\{\begin{bmatrix}0.001 & 0\\ 0 & 0.001\end{bmatrix}\right\}}_{\underbrace{\mathbf{Q}^*{}_{t0}}_{\text{T0VAR}}}\right)$$

Deterministic change:

$$\underbrace{\begin{bmatrix}\text{Stress}\\ \text{Quality}\end{bmatrix}(t)}_{\boldsymbol{\eta}(t)} = \left(\underbrace{\begin{bmatrix}\text{a11} & \text{a12}\\ \text{a21} & \text{a22}\end{bmatrix}}_{\underbrace{\mathbf{A}}_{\text{DRIFT}}} \underbrace{\begin{bmatrix}\text{Stress}\\ \text{Quality}\end{bmatrix}(t)}_{\boldsymbol{\eta}(t-1)} + \underbrace{\begin{bmatrix}0\\ 0\end{bmatrix}}_{\underbrace{\mathbf{b}}_{\text{CINT}}}\right) +$$

Random change:

$$\underbrace{UcorSDtoChol\left\{\begin{bmatrix}\text{diff11} & 0\\ \text{diff21} & \text{diff22}\end{bmatrix}\right\}}_{\underbrace{\mathbf{G}}_{\text{DIFFUSION}}} \underbrace{\begin{bmatrix}W_1\\ W_2\end{bmatrix}(t)}_{\mathbf{w}(t)}$$

Observations:

$$\underbrace{\begin{bmatrix}\text{Stress}\\ \text{Quality}\end{bmatrix}(t)}_{\mathbf{Y}(t)} = \underbrace{\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}}_{\underbrace{\boldsymbol{\Lambda}}_{\text{LAMBDA}}} \underbrace{\begin{bmatrix}\text{Stress}\\ \text{Quality}\end{bmatrix}(t)}_{\boldsymbol{\eta}(t)} + \underbrace{\begin{bmatrix}\text{mi\_stress}\\ \text{mi\_quality}\end{bmatrix}}_{\underbrace{\boldsymbol{\tau}}_{\text{MANIFESTMEANS}}} +$$

Observation noise:

$$\underbrace{\begin{bmatrix}\text{merr\_stress} & 0\\ 0 & \text{merr\_quality}\end{bmatrix}}_{\underbrace{\boldsymbol{\Theta}}_{\text{MANIFESTVAR}}} \underbrace{\begin{bmatrix}\epsilon_1\\ \epsilon_2\end{bmatrix}(t)}_{\boldsymbol{\epsilon}(t)}$$

System noise distribution per time step: $\left[W_{j\in[1,2]}\right](t) \sim \text{N}(0,1)$

Observation noise distribution: $\left[\epsilon_{j\in[1,2]}\right](t) \sim \text{N}(0,1)$

Note: *UcorSDtoChol* converts lower tri matrix of standard deviations and unconstrained correlations to Cholesky factor, *UcorSDtoCov* = transposed cross product of UcorSDtoChol, to give covariance, See Driver & Voelkle (2018) p11.
Individual specific notation (subscript i) only shown for subject parameter distribution – pop. means shown elsewhere.