1 Standard errors

Total covariance matrix

$$\boldsymbol{K} = \sum_{i=0}^{K-1} a_i \boldsymbol{K}_i \tag{1}$$

Total variance

$$\sigma^2 = \mathrm{var}\left(\boldsymbol{K}\right) = \frac{1}{N-1}\mathrm{tr}\left(\boldsymbol{P}^T\boldsymbol{K}\boldsymbol{P}\right) = \sum_{i=0}^{K-1} a_i \frac{1}{N-1}\mathrm{tr}\left(\boldsymbol{P}^T\boldsymbol{K}_i\boldsymbol{P}\right) = \sum_{i=0}^{K-1} a_i \mathrm{var}\left(\boldsymbol{K}_i\right) \tag{2}$$

Fractions of total variance

$$h_i = \frac{a_i \mathrm{var}\left(\boldsymbol{K}_i\right)}{\sigma^2} \tag{3}$$

Change of coordinate

$$\begin{cases} a_k = \frac{h_k \sigma^2}{\mathrm{var}(\boldsymbol{K}_k)} \\ a_{K-1} = \frac{(1-\sum_{j=0}^{K-2} h_j)\sigma^2}{\mathrm{var}(\boldsymbol{K}_{K-1})} \end{cases} \tag{4}$$

Jacobian

$$\boldsymbol{J} = \left(\frac{\partial(a_0,...,a_{K-1})}{\partial(\sigma^2,h_0,...,h_{K-2})}\right) = \begin{pmatrix} \frac{h_0}{\mathrm{var}(\boldsymbol{K}_0)} & \frac{\sigma^2}{\mathrm{var}(\boldsymbol{K}_0)} & \cdots & 0 \\ \vdots & 0 & \ddots & 0 \\ \frac{h_{K-2}}{\mathrm{var}(\boldsymbol{K}_{K-2})} & 0 & \cdots & \frac{\sigma^2}{\mathrm{var}(\boldsymbol{K}_{K-2})} \\ \frac{h_{K-1}}{\mathrm{var}(\boldsymbol{K}_{K-1})} & -\frac{\sigma^2}{\mathrm{var}(\boldsymbol{K}_{K-1})} & \cdots & -\frac{\sigma^2}{\mathrm{var}(\boldsymbol{K}_{K-1})} \end{pmatrix} \tag{5}$$

Tranformation of expected fisher information $\boldsymbol{F}$:

$$\boldsymbol{F}^{(\mathrm{new})} = \boldsymbol{J}^T\boldsymbol{F}\boldsymbol{J} \tag{6}$$