$$\boxed{\ln \mathcal{L}_{\rm spec}(\boldsymbol{\beta}) \propto (\mathbf{A}^{\top} \mathbf{N}^{-1} \mathbf{d})^{\top} (\mathbf{A}^{\top} \mathbf{N}^{-1} \mathbf{A})^{-1} (\mathbf{A}^{\top} \mathbf{N}^{-1} \mathbf{d}),}$$