

$$\tilde{\alpha} = \alpha \beta^{-m} = \begin{pmatrix} \omega_k^{-2y} \omega_{2d}^{2m} & 0 & 0 \\ 0 & \omega_k^y \omega_{2d}^{-m} & 0 \\ 0 & 0 & \omega_k^y \omega_{2d}^{-m} \end{pmatrix}$$