Se $C_{hh}$ è invertibile, si ha $\boxed{h-h^* = -C_{hh}^{-1}\, C_{hg}\,(g-g^*)}$

eq. parametrice del sottospazio di regressione di $h$ data $g$

Sostituiamo in $\Delta Q$:

$$
\begin{aligned}
m\,\Delta Q \simeq\ & (g-g^*)^T C_{gh}\, C_{hh}^{-T}\, \cancel{C_{hh}}\, \cancel{C_{hh}^{-1}}\, C_{hg}(g-g^*) \\
& - 2(g-g^*)^T C_{gh}\, C_{hh}^{-T}\, C_{hg}(g-g^*) + (g-g^*)^T C_{gg}(g-g^*) \\
=\ & (g-g^*)^T \left[ \cancel{C_{gh}\, C_{hh}^{-T}\, C_{hg}} - \cancel{2}\, C_{gh}\, C_{hh}^{-T}\, C_{hg} + C_{gg} \right](g-g^*) \\
=\ & (g-g^*)^T\, C^{gg}\, (g-g^*)
\end{aligned}
$$

dove $\boxed{C^{gg} = C_{gg} - C_{gh}\, C_{hh}^{-1}\, C_{hg}}$

Calcoliamo $C^{gg}$ in modo puramente algebrico:

$$
C\,\Delta x = D \text{ (eq. normale)} \Rightarrow \begin{cases} C_{hh}\,\Delta h + C_{hg}\,\Delta g = D_h \\ C_{gh}\,\Delta h + C_{gg}\,\Delta g = D_g \end{cases} \quad (\square)
$$

elimino $\Delta h$: $\quad \Delta h = C_{hh}^{-1}\left[D_h - C_{hg}\,\Delta g\right] \leftarrow$ dalla 1ª eq. in ($\square$)

sostituendo nella 2ª eq. in ($\square$) $\quad C_{gh}\, C_{hh}^{-1}\left[D_h - C_{hg}\,\Delta g\right] + C_{gg}\,\Delta g = D_g \quad (*)$

~~Osservo che, posto~~ $\cancel{\Gamma = \begin{bmatrix} \Gamma_{hh} & \Gamma_{hg} \\ \Gamma_{gh} & \Gamma_{gg} \end{bmatrix} = C^{-1}}$,

~~per cui~~ $\cancel{\Delta x = \Gamma D}$, ~~si ha~~

cioè $\underbrace{\left[C_{gg} - C_{gh}\, C_{hh}^{-1}\, C_{hg}\right]}_{C^{gg}} \Delta g = D_g - C_{gh}\, C_{hh}^{-1}\, D_h \quad (**)$