$$
\mathbf{T}_{ab} = \left[\begin{array}{ccc|ccc}
\cos\gamma_{ab} & \sin\gamma_{ab} & 0 & 0 & 0 & 0 \\
-\sin\gamma_{ab} & \cos\gamma_{ab} & 0 & 0 & 0 & 0 \\
0 & 0 & 1 & 0 & 0 & 0 \\
\hline
0 & 0 & 0 & \cos\gamma_{ab} & \sin\gamma_{ab} & 0 \\
0 & 0 & 0 & -\sin\gamma_{ab} & \cos\gamma_{ab} & 0 \\
0 & 0 & 0 & 0 & 0 & 1
\end{array}\right].
$$

$$
\mathbf{r}_{ab} = \mathbf{T}_{ab}^{-1}\mathbf{r}_{ab}^{*} = \mathbf{T}_{ab}^{\mathrm{T}}\mathbf{r}_{ab}^{*}
$$

$$
\mathbf{r}_{ab}^{*} = \begin{Bmatrix} u_a^{*} \\ w_a^{*} \\ \varphi_a^{*} \\ u_b^{*} \\ w_b^{*} \\ \varphi_b^{*} \end{Bmatrix} = \mathbf{T}_{ab}\mathbf{r}_{ab} = \begin{Bmatrix} u_a c + w_a s \\ -u_a s + w_a c \\ \varphi_a \\ u_b c + w_b s \\ -u_b s + w_b c \\ \varphi_b \end{Bmatrix}
$$

$$
\mathbf{R}_{ab}^{*} = \mathbf{T}_{ab}\mathbf{R}_{ab}\,, \qquad \mathbf{R}_{ab} = \mathbf{T}_{ab}^{-1}\mathbf{R}_{ab}^{*} = \mathbf{T}_{ab}^{\mathrm{T}}\mathbf{R}_{ab}^{*}
$$

$$
\overline{\mathbf{R}}_{ab} = \begin{Bmatrix} \overline{X}_{ab} \\ \overline{Z}_{ab} \\ \overline{M}_{ab} \\ \overline{X}_{ba} \\ \overline{Z}_{ba} \\ \overline{M}_{ba} \end{Bmatrix} = \mathbf{T}_{ab}^{\mathrm{T}}\overline{\mathbf{R}}_{ab}^{*} = \begin{Bmatrix} \overline{X}_{ab}^{*} c - \overline{Z}_{ab}^{*} s \\ \overline{X}_{ab}^{*} s + \overline{Z}_{ab}^{*} c \\ \overline{M}_{ab}^{*} \\ \overline{X}_{ba}^{*} c - \overline{Z}_{ba}^{*} s \\ \overline{X}_{ba}^{*} s + \overline{Z}_{ba}^{*} c \\ \overline{M}_{ba}^{*} \end{Bmatrix}
$$

$$
\hat{\mathbf{R}}_{ab} = \mathbf{T}_{ab}^{\mathrm{T}}\hat{\mathbf{R}}_{ab}^{*} = \mathbf{T}_{ab}^{\mathrm{T}}\mathbf{k}_{ab}^{*}\mathbf{r}_{ab}^{*} = \mathbf{T}_{ab}^{\mathrm{T}}\mathbf{k}_{ab}^{*}\mathbf{T}_{ab}\mathbf{r}_{ab} = \mathbf{k}_{ab}\mathbf{r}_{ab}
$$

$$
\mathbf{k}_{ab} = \mathbf{T}_{ab}^{\mathrm{T}}\mathbf{k}_{ab}^{*}\mathbf{T}_{ab}
$$