TJ-44 机电特性矩阵

刚度系数矩阵

$$\begin{pmatrix} C_{11} & C_{12} & C_{13} & 0 & 0 & 0 \\ C_{12} & C_{11} & C_{13} & 0 & 0 & 0 \\ C_{13} & C_{13} & C_{33} & 0 & 0 & 0 \\ 0 & 0 & 0 & C_{44} & 0 & 0 \\ 0 & 0 & 0 & 0 & C_{55} & 0 \\ 0 & 0 & 0 & 0 & 0 & C_{66} \end{pmatrix}^{E} = \begin{pmatrix} 16.1 & 10.3 & 10.3 & 0 & 0 & 0 \\ 10.3 & 16.1 & 10.3 & 0 & 0 & 0 \\ 10.3 & 10.3 & 13.8 & 0 & 0 & 0 \\ 0 & 0 & 0 & 3.0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 3.0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 2.9 \end{pmatrix}^{E} 10^{10} N/m^{2}$$

$$\begin{pmatrix} C_{11} & C_{12} & C_{13} & 0 & 0 & 0 \\ C_{12} & C_{11} & C_{13} & 0 & 0 & 0 \\ C_{13} & C_{13} & C_{33} & 0 & 0 & 0 \\ 0 & 0 & 0 & C_{44} & 0 & 0 \\ 0 & 0 & 0 & 0 & C_{55} & 0 \\ 0 & 0 & 0 & 0 & 0 & C_{66} \end{pmatrix}^{D} = \begin{pmatrix} 16.1 & 10.3 & 9.6 & 0 & 0 & 0 \\ 10.3 & 16.1 & 9.6 & 0 & 0 & 0 \\ 9.6 & 9.6 & 17.2 & 0 & 0 & 0 \\ 0 & 0 & 0 & 5.5 & 0 & 0 \\ 0 & 0 & 0 & 0 & 5.5 & 0 \\ 0 & 0 & 0 & 0 & 0 & 2.9 \end{pmatrix}^{D} 10^{10} N/m^{2}$$

弹性柔顺系数矩阵

$$\begin{pmatrix} S_{11} & S_{12} & S_{13} & 0 & 0 & 0 \\ S_{12} & S_{11} & S_{13} & 0 & 0 & 0 \\ S_{13} & S_{13} & S_{33} & 0 & 0 & 0 \\ 0 & 0 & 0 & S_{44} & 0 & 0 \\ 0 & 0 & 0 & 0 & S_{55} & 0 \\ 0 & 0 & 0 & 0 & 0 & S_{66} \end{pmatrix}^{E} = \begin{pmatrix} 13.3 & -4.1 & -6.9 & 0 & 0 & 0 \\ -4.1 & 13.3 & -6.9 & 0 & 0 & 0 \\ -6.9 & -6.9 & 17.6 & 0 & 0 & 0 \\ 0 & 0 & 0 & 33.9 & 0 & 0 \\ 0 & 0 & 0 & 0 & 33.9 & 0 \\ 0 & 0 & 0 & 0 & 0 & 34.8 \end{pmatrix}^{E} 10^{-12} m^{2}/N$$

$$\begin{pmatrix} S_{11} & S_{12} & S_{13} & 0 & 0 & 0 \\ S_{12} & S_{11} & S_{13} & 0 & 0 & 0 \\ S_{13} & S_{13} & S_{33} & 0 & 0 & 0 \\ 0 & 0 & 0 & S_{44} & 0 & 0 \\ 0 & 0 & 0 & 0 & S_{55} & 0 \\ 0 & 0 & 0 & 0 & 0 & S_{66} \end{pmatrix}^{D} = \begin{pmatrix} 11.8 & -5.5 & -3.5 & 0 & 0 & 0 \\ -5.5 & 11.8 & -3.5 & 0 & 0 & 0 \\ -3.5 & -3.5 & 9.7 & 0 & 0 & 0 \\ 0 & 0 & 0 & 18.2 & 0 & 0 \\ 0 & 0 & 0 & 0 & 18.2 & 0 \\ 0 & 0 & 0 & 0 & 0 & 34.6 \end{pmatrix}^{D} 10^{-12} m^{2}/N$$

受夹介电常数矩阵

$$
\begin{pmatrix} \varepsilon_{11} & 0 & 0 \\ 0 & \varepsilon_{11} & 0 \\ 0 & 0 & \varepsilon_{33} \end{pmatrix}^{S} = \begin{pmatrix} 780 & 0 & 0 \\ 0 & 780 & 0 \\ 0 & 0 & 630 \end{pmatrix}^{S}
$$

自由介电常数矩阵

$$
\begin{pmatrix} \varepsilon_{11} & 0 & 0 \\ 0 & \varepsilon_{11} & 0 \\ 0 & 0 & \varepsilon_{33} \end{pmatrix}^{T} = \begin{pmatrix} 1460 & 0 & 0 \\ 0 & 1460 & 0 \\ 0 & 0 & 1200 \end{pmatrix}^{T}
$$

压电常数矩阵

$$
\begin{pmatrix} 0 & 0 & 0 & 0 & d_{15} & 0 \\ 0 & 0 & 0 & d_{24} & 0 & 0 \\ d_{31} & d_{31} & d_{33} & 0 & 0 & 0 \end{pmatrix} = \begin{pmatrix} 0 & 0 & 0 & 0 & 450 & 0 \\ 0 & 0 & 0 & 450 & 0 & 0 \\ -125 & -125 & 290 & 0 & 0 & 0 \end{pmatrix} 10^{-12} C/N
$$

$$
\begin{pmatrix} 0 & 0 & 0 & 0 & g_{15} & 0 \\ 0 & 0 & 0 & g_{24} & 0 & 0 \\ g_{31} & g_{31} & g_{33} & 0 & 0 & 0 \end{pmatrix} = \begin{pmatrix} 0 & 0 & 0 & 0 & 34.8 & 0 \\ 0 & 0 & 0 & 34.8 & 0 & 0 \\ -11.8 & -11.8 & 27.3 & 0 & 0 & 0 \end{pmatrix} 10^{-3} Vm/N
$$

$$
\begin{pmatrix} 0 & 0 & 0 & 0 & e_{15} & 0 \\ 0 & 0 & 0 & e_{24} & 0 & 0 \\ e_{31} & e_{31} & e_{33} & 0 & 0 & 0 \end{pmatrix} = \begin{pmatrix} 0 & 0 & 0 & 0 & 13.5 & 0 \\ 0 & 0 & 0 & 13.5 & 0 & 0 \\ -3.1 & -3.1 & 14.3 & 0 & 0 & 0 \end{pmatrix} C/m^{2}
$$

$$
\begin{pmatrix} 0 & 0 & 0 & 0 & h_{15} & 0 \\ 0 & 0 & 0 & h_{24} & 0 & 0 \\ h_{31} & h_{31} & h_{33} & 0 & 0 & 0 \end{pmatrix} = \begin{pmatrix} 0 & 0 & 0 & 0 & 19.1 & 0 \\ 0 & 0 & 0 & 19.1 & 0 & 0 \\ -4.9 & -4.9 & 24.3 & 0 & 0 & 0 \end{pmatrix} 10^{8} V/m
$$