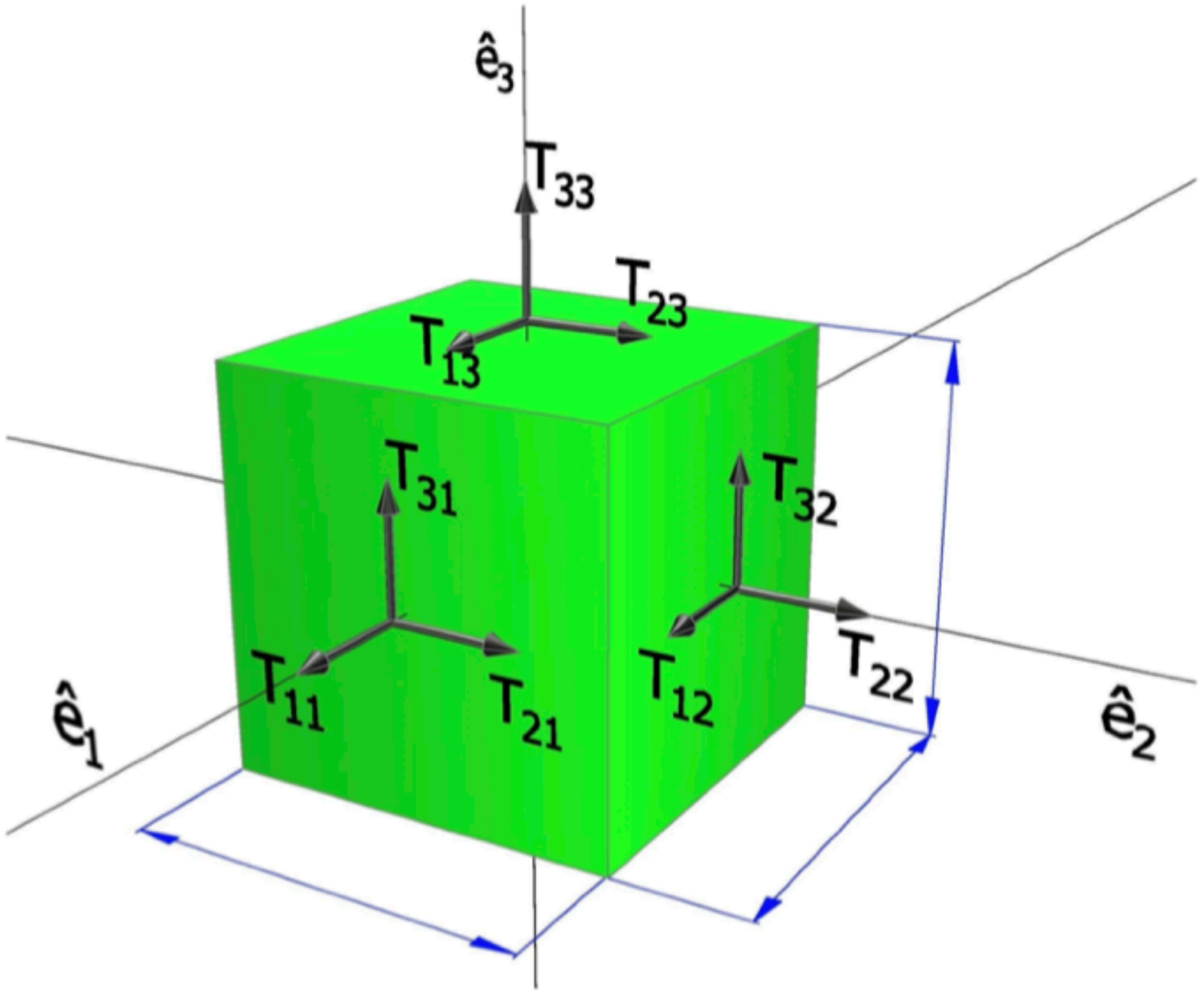
Mechanical modes

$$\frac{\partial}{\partial r_j} \boxed{T_{ij}(\boldsymbol{r}, t)} = \boxed{\rho_0(\boldsymbol{r}) \frac{\partial^2 U_i}{\partial t^2}} - \boxed{f_i(\boldsymbol{r}, t)}$$

Stress tensor　acceleration　External force

$$T_{ij} = \boxed{c_{ijkl} S_{kl}} + \boxed{\eta_{ijkl} \frac{\partial S_{kl}}{\partial t}}$$

Stiffness (Hooke's law)　Friction



Mechanical modes

$$\frac{\partial}{\partial r_j}T_{ij}(\boldsymbol{r},t) = \rho_0(\boldsymbol{r})\frac{\partial^2 U_i}{\partial t^2} - f_i(\boldsymbol{r},t)$$

Stress tensor — acceleration — External force

$$T_{ij} = c_{ijkl}S_{kl} + \eta_{ijkl}\frac{\partial S_{kl}}{\partial t}$$

Stiffness (Hooke's law) — Friction

$$S_{ij} = \frac{1}{2}\left(\frac{\partial U_i}{\partial r_j} + \frac{\partial U_j}{\partial r_i}\right)$$

Strain Tensor

$$\left[(\lambda+2\mu)+\eta_{11}\frac{\partial}{\partial t}\right]\nabla(\nabla\cdot\boldsymbol{U}) - \left[\mu+\eta_{44}\frac{\partial}{\partial t}\right]\nabla\times\nabla\times\boldsymbol{U} = \rho\frac{\partial^2\boldsymbol{U}}{\partial t^2}$$

longitudinal waves ($\nabla\times\mathbf{u}=0$) — shear-only ($\nabla\cdot\mathbf{u}=0$)

Elastic wave equation