In order to satisfy the minimal case of J_1 using $\vec{e}$, we need to maximize the term $\vec{e}^T\mathbf{S}\vec{e}$.

Let us use the Lagrange multiplier λ subject to the contruct $||e|| = 1$,

$$\vec{u} = \vec{e}^T\mathbf{S}\vec{e} - \lambda(\vec{e}^T\vec{e} - 1) \tag{14}$$

$$\frac{\partial \vec{u}}{\partial \vec{e}} = 2\mathbf{S}\vec{e} - 2\lambda\vec{e} \tag{15}$$

$$\Rightarrow \mathbf{S}\vec{e} = \lambda\vec{e} \tag{16}$$