uster Problem with inequality constraint

$f(\vec{\tau}) = -\vec{\tau}^T\vec{\tau}$ subj to $\vec{M}_d = \underline{\underline{R}}_N \vec{\tau}$ and $\vec{\tau} > \vec{0}$

, let's do this in 2D

$_1, \tau_2) = -(\tau_1^2 + \tau_2^2)$ $\quad M_1 = R_{11}\tau_1 + R_{12}\tau_2 \quad -\tau_1 < 0$ } for standard form

$M_2 = R_{21}\tau_1 + R_{22}\tau_2 \quad -\tau_2 < 0$

$L = -\vec{\tau}^T\vec{\tau} + \vec{\lambda}^T(\vec{M} - \underline{\underline{R}}_N\vec{\tau}) + \vec{\mu}^T\vec{\tau}$

$(\tau_1^2 + \tau_2^2) + \lambda_1(M_1 - R_{11}\tau_1 - R_{12}\tau_2) + \lambda_2(M_2 - R_{21}\tau_1 - R_{22}\tau_2) + \mu_1\tau_1 + \mu_2\tau_2$

$$\left.\begin{aligned} &-2\tau_1 + \lambda_1(-R_{11}) + \lambda_2(-R_{21}) + \mu_1 \\ &-2\tau_2 + \lambda_1(-R_{12}) + \lambda_2(-R_{22}) + \mu_2 \end{aligned}\right\} \Rightarrow \boxed{\vec{0} = -2\vec{\tau} - \underline{\underline{R}}_N^T\vec{\lambda} + \vec{\mu}}$$

$M_1 - R_{11}\tau_1 - R_{12}\tau_2 \quad \frac{\partial L}{\partial \lambda_2} = M_2 - R_{12}\tau_1 +^{-} \lambda_2 R_{22} \Rightarrow \boxed{\vec{M} = \underline{\underline{R}}_N\vec{\tau}}$

I'm not sure you can solve this analytically

$\tau_1 \quad \frac{\partial L}{\partial \mu_2} = \tau_2$ } combine $\begin{Bmatrix}\tau_1 \\ \tau_2\end{Bmatrix} = 0 \quad \frac{\partial L}{\partial \vec{\mu}} = \vec{\tau} = 0 \quad \boxed{\vec{\tau} = 0}$ or $\boxed{\vec{\mu} = 0}$