

$$\begin{aligned}
\boldsymbol{H} \cdot \frac{\partial^2 \psi}{\partial \boldsymbol{F} \partial \boldsymbol{F}} \cdot \boldsymbol{H} &= \boldsymbol{H} \cdot \frac{\partial^2 \psi(\boldsymbol{F} \boldsymbol{F}_a^{-1})}{\partial \boldsymbol{F} \partial \boldsymbol{F}} \cdot \boldsymbol{H} = \boldsymbol{H} \boldsymbol{F}_a^{-1} \cdot \frac{\partial^2 \psi}{\partial \boldsymbol{F} \partial \boldsymbol{F}} \cdot \boldsymbol{H} \boldsymbol{F}_a^{-1} > 0
\end{aligned}$$