

EGONKORTASUNEAKO BALDINTZAK POTENTZIAL TERMODINAMIKOETAN

$$\boxed{S} \quad \boxed{U} \quad \boxed{F} \quad \boxed{H} \quad \boxed{G}$$

$$S_{UU} \leq 0 \quad S_{VV} \leq 0 \quad S_{UU} S_{VV} - S_{UV}^2 \geq 0 \quad \text{MAXIMOA}$$

$$U_{SS} \geq 0 \quad U_{VV} \geq 0 \quad U_{SS} U_{VV} - U_{SV}^2 \geq 0 \quad \text{MINIMOA}$$

POTENTZIALETARAKO BIDEA

$$P = \frac{\partial U}{\partial X}$$

$$X = - \frac{\partial U[P]}{\partial P}$$

$$\frac{\partial X}{\partial P} = \frac{\partial}{\partial P} \left[- \frac{\partial U[P]}{\partial P} \right] = - \frac{\partial^2 U[P]}{\partial P^2}$$

$$\frac{1}{\left(\frac{\partial P}{\partial X} \right)} = \frac{1}{\frac{\partial}{\partial X} \left(\frac{\partial U}{\partial X} \right)} = \frac{1}{\left(\frac{\partial^2 U}{\partial X^2} \right)}$$

$$- \frac{\partial^2 U[P]}{\partial P^2} = \frac{1}{\left(\frac{\partial^2 U}{\partial X^2} \right)}$$

$$F_{TT} \leq 0 \quad F_{VV} \geq 0 \quad \text{MINIMOA}$$

$$H_{SS} \geq 0 \quad H_{PP} \leq 0 \quad \text{MINIMOA}$$

$$G_{TT} \leq 0 \quad G_{PP} \leq 0 \quad G_{TT} G_{PP} - G_{TP}^2 \geq 0 \quad \text{MINIMOA}$$