Stability Diagram

Consider the system

$$\dot{\mathbf{x}} = \mathbf{J}\mathbf{x}$$

Let λ_1 and λ_2 be eigenvalues of $\mathbf{J}\mathbf{x}$

Results from Linear Algebra give $tr(\mathbf{J}) = \lambda_1 + \lambda_2$, $\det|\mathbf{J}| = \lambda_1 \cdot \lambda_2$, and $D = (j_{11} - j_{22})^2 + 4j_{12}j_{21}$

The figure shows the **Stability Diagram** for $\dot{\mathbf{x}} = \mathbf{J}\mathbf{x}$ with axes of $tr(\mathbf{J})$ vs $\det|\mathbf{J}|$