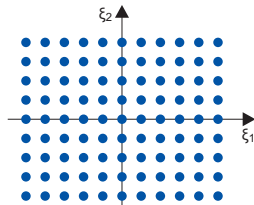


## Ohne Erregung und ein reeller EW

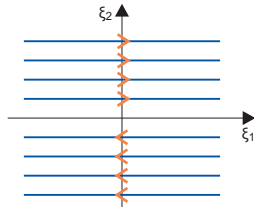
$\lambda = 0$  und Matrix  $\mathbf{A} = \mathbf{0}$

- stabil
- Ebene von Ruhelagen



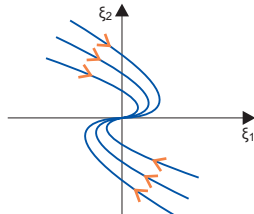
$\lambda = 0$  und Matrix  $\mathbf{A} \neq \mathbf{0}$

- instabil



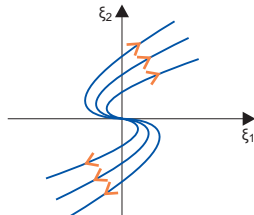
$\lambda < 0$  und  $\mathbf{A} \neq \begin{bmatrix} \lambda & 0 \\ 0 & \lambda \end{bmatrix}$

- asymptotisch stabil
- Knoten 3. Art



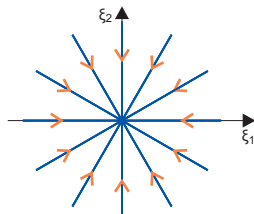
$\lambda > 0$  und  $\mathbf{A} \neq \begin{bmatrix} \lambda & 0 \\ 0 & \lambda \end{bmatrix}$

- instabil
- Knoten 3. Art



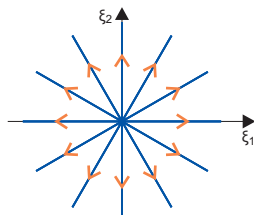
$\lambda < 0$  und  $\mathbf{A} = \begin{bmatrix} \lambda & 0 \\ 0 & \lambda \end{bmatrix}$

- asymptotisch stabil
- Knoten 1. Art



$\lambda > 0$  und  $\mathbf{A} = \begin{bmatrix} \lambda & 0 \\ 0 & \lambda \end{bmatrix}$

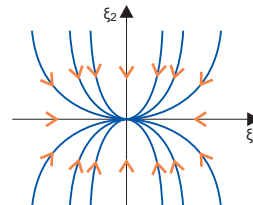
- instabil
- Knoten 1. Art



## Ohne Erregung und zwei reelle EW

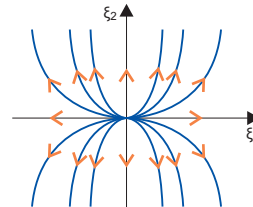
$\lambda_2 < \lambda_1 < 0$  neg. EW

- asymptotisch stabil
- Knoten 2. Art
- Knotenpunkt



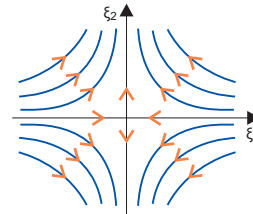
$0 < \lambda_1 < \lambda_2$  pos. EW

- instabil
- Knoten 2. Art
- Knotenpunkt



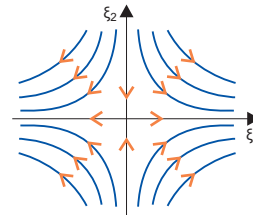
$\lambda_1 < 0 < \lambda_2$  ungleiche Vorzeichen

- instabil
- Sattelpunkt
- Hyperbelform



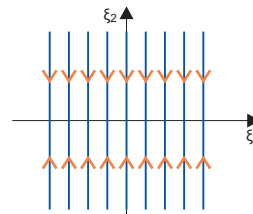
$\lambda_2 < 0 < \lambda_1$

- instabil
- Sattelpunkt



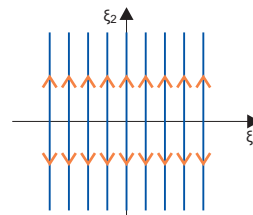
$\lambda_2 < 0 = \lambda_1$

- stabil



$\lambda_1 = 0 < \lambda_2$

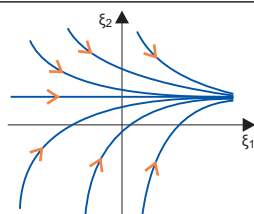
- instabil



## Mit Erregung und reellen EW

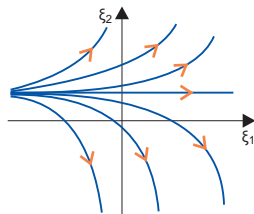
$\lambda_2 < 0 = \lambda_1$

- instabil



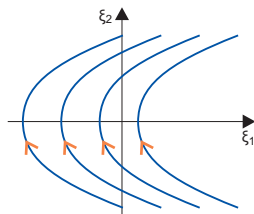
$\lambda_1 = 0 < \lambda_2$

- instabil



$\lambda_1 = \lambda_2 = 0$  und  $\mathbf{A} \neq \mathbf{0}$

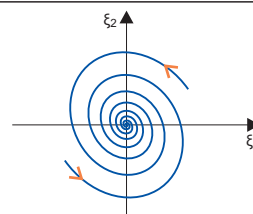
- instabil



## Ohne Erregung und komplexen EW

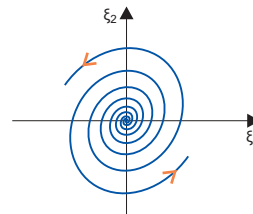
$\alpha < 0; \beta > 0$   $\lambda_{1,2} = \alpha \pm j\beta$

- asymptotisch stabil
- Strudelpunkt
- Drehsinn in  $x_1/x_2$ -Ebene evtl. anders!



$\alpha > 0; \beta > 0$

- instabil
- Strudelpunkt
- Drehsinn in  $x_1/x_2$ -Ebene evtl. anders!



$\alpha = 0; \beta > 0$

- stabil
- Wirbelpunkt
- Drehsinn in  $x_1/x_2$ -Ebene evtl. anders!

