Exercise(s) 4. 6. 2026

The last exercise is to be handed in at the beginning of the next lecture.

31. Study the 2:-1 resonance, the dynamics near an equilibrium on $\mathbb{R}^4$ with canonical Poisson structure that has the quadratic part

$$H_0^0(q,p) \quad = \quad p_1^2 + q_1^2 \; - \; \frac{p_2^2 + q_2^2}{2} \quad .$$

32. Study the 1:-3 resonance, the dynamics near an equilibrium on $\mathbb{R}^4$ with canonical Poisson structure that has the quadratic part

$$H(q,p) \quad = \quad \frac{p_1^2 + q_1^2}{2} \; - \; 3\,\frac{p_2^2 + q_2^2}{2} \quad .$$

Exemplify your considerations for the cubic higher order term $H_1^0(q,p) = 2q_1q_2^2$.