FIRST AND SECOND MELNIKOV FUNCTION AND LIMIT CYCLES OF DISCONTINUOUS SYSTEMS WITH n PIECES

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Abstract. In this seminar will be exhibit explicitly the first and second order Melnikov function for the piecewise smooth vector fields in the case where the domain is decomposed in n regions limited by half-lines r_i and r_{i+1} emanating from the origin, with $i = 1, \ldots, n$ and $r_{n+1} \equiv r_1$. For explicitly the first order Melnikov function in each of the n regions, we consider a non-Hamiltonian system Z^i given by

$$Z^i(x,y) = \begin{cases} \dot{x} = \dfrac{H^i_y(x,y)}{R^i(x,y)} \\ \\ \dot{y} = -\dfrac{H^i_x(x,y)}{R^i(x,y)} \end{cases}$$

where H^i, R^i are C^r functions. For explicitly the second order Melnikov function in each of the n regions, we consider a Hamiltonian system given by

$$dH^i(x,y) + \varepsilon w^i_0 + \varepsilon^2 w^i_1 = 0$$

with $\omega^i_0 = g^i_0(x,y)dx - f^i_0(x,y)dy, \omega^i_1 = g^i_1(x,y)dx - f^i_1(x,y)dy$.

References

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