Analysis of some periodic problems via topological methods

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Abstract: In this talk we study a general class of planar periodic non-autonomous Hamiltonian systems trough the use of different topological methods such as bifurcation theory, the Poincaré–Birkhoff theorem and topological horseshoe theory.

As a result of this analysis, it will be first shown the existence and multiplicity of subharmonic solutions for any configuration of the periodic weights. Secondly, as long as the system exhibits twist and stretching dynamics, it will be possible to prove the existence of chaos in a general sense implying the most common chaotic dynamics definitions.

References:

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[2] J. López-Gómez, E. Muñoz-Hernández and F. Zanolin, Subharmonic solutions for a class of predator-prey models with degenerate weights in periodic environments, *Open Mathematics*, **21** (2023), 1-54.