Lower Bounds for the Number of Limit Cycles in Piecewise Polynomial Holomorphic Systems

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In this work, we focus on establishing lower bounds for the number of limit cycles in piecewise polynomial holomorphic systems that have a straight line of discontinuity. Our approach involves several perspectives: analyzing the number of zeros in the first and second-order averaging functions, controlling limit cycles arising from a monodromic equilibrium point through a degenerate Andronov–Hopf bifurcation, and finally considering sliding effects. Additionally, we apply the Poincaré–Miranda theorem to construct an explicit piecewise linear holomorphic system with three limit cycles, result that improves the known examples in the literature that had a single limit cycle.