The 16th Hilbert problem: a simple version on algebraic limit cycles

XIANG ZHANG

Department of Matematics, Shanghai Jiaotong University, Shanghai 200240, P. R. China E-mail: xzhang@sjtu.edu.cn

For real planar polynomial differential systems there appeared a simple version of the 16th Hilbert problem on algebraic limit cycles: Is there an upper bound on the number of algebraic limit cycles of all real planar polynomial vector fields of degree n? In [1] Llibre, Ramírez and Sadovskia solved the problem in the case of invariant algebraic curves generic for the vector fields. The same authors [2] also provided an upper bound on the number of algebraic limit cycles for polynomial vector fields having only nonsingular invariant algebraic curves.

In this talk we report our results [3], which solved the problem for planar polynomial vector fields either having only nodal invariant algebraic curves, or having only non-dicritical invariant algebraic curves.

References

- J. Llibre, R. Ramírez and N. Sadovskaia, On the 16th Hilbert problem for algebraic limit cycles, J. Differential Equations 248 (2010), 1401–1409.
- [2] J. Llibre, R. Ramírez and N. Sadovskaia, On the 16th Hilbert problem for limit cycles on nonsingular algebraic curves, J. Differential Equations 250 (2011), 983–999.
- [3] Xiang Zhang, The 16th Hilbert problem on algebraic limit cycles, J. Differential Equations 251 (2011), 1778–1789.