

Number of invariant straight lines for homogeneous polynomial vector fields of arbitrary degree and dimension

JAUME LLIBRE¹, VIOLETTA PILYUGINA²

¹ *Department of Mathematics, Universitat Autònoma de Barcelona, 08193–Bellaterra (Barcelona), Catalonia, Spain.*

E-mail: jllibre@mat.uab.cat *URL:* <http://www.gsd.uab.cat>

² *Department of Applied Math., St. Petersburg State University of Architecture and Civil Engineering, Second Krasnoarmejskaja 4, 190005, St. Petersburg, Russia.*

E-mail: vpilyugina@web.de *URL:* <http://www.spbgasu.ru>

We study the number of invariant straight lines through the origin of the homogeneous polynomial differential systems of degree m in \mathbb{R}^d or \mathbb{C}^d , when this number is finite. This notion extends in the natural way the classical notion of eigenvectors of homogeneous linear differential systems to homogeneous polynomial differential systems. This number provides an upper bound for the number of infinite singular points of the polynomial differential systems of degree m in \mathbb{R}^d . This upper bound is reached if all the invariant straight lines through the origin are real.