

# **HILBERT'S 16TH PROBLEM ON A PERIOD ANNULUS AND NASH SPACE OF ARCS**

LUBOMIR GAVRILOV, JEAN-PIERRE FRANÇOISE, DONGMEI XIAO

We consider a general perturbation setting of an integrable family within polynomial planar vector fields of bounded degree. It is assumed that the integrable family is defined as the zero-set of a Bautin ideal of the ring of polynomials in the coefficients of the components. We show that the Nash's space of arcs of the zero-set plays a key role in the reduction of the bifurcation problem of limit cycles to finding zeros of a particular principal bifurcation function associated to an essential perturbation.

<https://arxiv.org/abs/1610.07582>