Finding New Integrals of the Algaba System

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Abstract. We consider an autonomous system of ordinary differential equations, which is resolved with respect to derivatives. To study local integrability of the system near a degenerate stationary point, we use an approach based on Power Geometry[2] and on the computation of the resonant normal form[3, 4]. For the partial non Hamilton 5-parameter case of concrete planar system[1], we found the complete set of necessary conditions on parameters of the system for which the system is locally integrable near a degenerate stationary point. These sets of parameters, satisfying the conditions, consist of 4 two-parameter subsets in this 5-parameter space. The first integral of motion corresponds of each such subset[5]. But along the hyper plane $b^2 = 2/3$ there can exist additional such subsets[6]. We have found two more first integrals of motion.

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References


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