Normal Forms of the Euler–Poisson Equations[*]

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Abstract. In the paper [1] the special case of the Euler–Poisson equations describing motion of a heavy rigid body with a fixed point is considered. Near stationary points of the system two of one-parameter families were chosen. These families are corresponded to the resonance of eigenvalues $(0, 0, \lambda, -\lambda, 2\lambda, -2\lambda)$ of the matrix of a linear part of the system. Also in the paper [1] it was suggested a hypothesis about absence of the additional first integral near these families, except of classical cases of global integrability. In this report that supposition is proved using calculations of coefficients of the normal form. All calculations were produced by the package described in [2] which was created in the MATHEMATICA system.

1. Bruno, A.D.: Theory of Normal Forms of the Euler–Poisson Equations. Preprint No. 100, M., Keldysh Institute for Applied Mathematics of RAS, 27 p. (2005). In Russian.
http://dl.dropbox.com/u/59058738/Preprint100.pdf .
2. Edneral, V.F.: On Algorithm of the Normal Form Building. Proceedings of CASC 2007, ed. by Ganzha et al., LNCS 4770, 134-142 (2007)]