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Franz Winkler* (franz.winkler@risc.jku.at), RISC, J. Kepler University, Altenbergerstr. 69, A-4040 Linz, Austria. *Existence and computation of rational general solutions of parametrizable ODEs.*

Consider an autonomous ODE of the form $F(y, y') = 0$, where F is a bivariate polynomial. We can think of F as defining a plane algebraic curve. If this curve admits a rational parametrization, then we can determine whether the ODE has a rational general solution. Based on degree bounds for such parametrizations by Sendra and Winkler, Feng and Gao have described an algorithm for this problem.

Here we consider the case of a non-autonomous ODE of the form $F(x, y, y') = 0$. The tri-variate polynomial F defines an algebraic surface, which we assume to admit a rational parametrization. Based on such a parametrization and on knowledge about a degree bound for general rational solutions, we can determine the existence of a general rational solution, and, in the positive case, also compute one. (Received September 10, 2010)