

# Global dynamics of the Kummer–Schwarz differential equation

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In this talk/poster we present the study of the Kummer–Schwarz differential equation  $2\dot{x}\ddot{x} - 3\dot{x}^2 = 0$  which is of special interest due to its relationship with the Schwarzian derivative. This differential equation is transformed into a first order differential system in  $\mathbb{R}^3$ , and we provide a complete description of its global dynamics adding the infinity.

## References

- [1] B. Abraham-Shrauner, P. Leach, K. Govinder and G. Ratcliff, *Hidden and contact symmetries of ordinary differential equations*, J. Phys. A: Math. Gen. **28**, (1995), 6707–6716.
- [2] A. Cima and J. Llibre, *Bounded polynomial vector fields*, Trans. Amer. Math. Soc. **318** (1990), 557–579.
- [3] F. Dumortier, J. Llibre and J.C. Artés, *Qualitative theory of planar differential systems*, *UniversiText*, Springer–Verlag, New York, 2006.
- [4] K. Goviender and P. Leach, *The algebraic structure of the first integrals of third-order linear equations*, J. Math. Anal. Appl. **195** (1995), 114–133.
- [5] P. Leach, *On the uniqueness of the Schwarzian and linearisation by nonlocal contact transformation*, J. Math. Anal. Appl. **235** (1999), 84–107.
- [6] P. Leach, *Symmetry and singularity properties of the generalised Kummer-Schwarz and related topics*, J. Math. Anal. Appl. **348** (2008), 487–493.
- [7] C. Vidal and P. Gómez, *An extension of the Poincaré compactification and a geometric interpretation*, Proyecciones **22**, 3 (2003), 161–180.