Slow-fast field with external numbers

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Abstract

This research is concerned with the study of Duck solutions to a non-linear differential equation involving external numbers, where such numbers were the new addition to this field of research. The equation in question is inspired by the "J-L Callot equation", but in a more complex form. In particular, we proved the existence of Canard solutions for the fast-slow system using a new method, we were able to determine the level of jump in each case, either upwards or downwards (where the question has always been, among ODE professionals, to which side the Canard solution jumps), and we knew about the jump abscesses. The appendix is devoted to the numerical part, which shows the adequacy between theory and experience.

Keywords: Nonstandard, external numbers, differential equation, Canard's solution, singular perturbation.

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