

Slow-fast Bogdanov-Takens bifurcations in an application

P. De Maesschalck¹, M. Wechselberger²

We study a more degenerate version of the well-known slow-fast Van der Pol system, this time with a singularity that singularly unfolds as a Bogdanov-Takens bifurcation. We base ourselves on the local study performed in [1], complement it with a global geometric singular perturbation analysis (in [2]) to give a thorough view of all involved bifurcations such as Hopf, Homoclinic, SNIC bifurcations.

References

- [1] DE MAESSCHALCK, P. AND DUMORTIER, F., Slow-fast Bogdanov-Takens bifurcations, *Journal of Differential Equations* **250** (2) (2011), 1000–1025.
- [2] DE MAESSCHALCK, P. AND WECHSELBERGER, M., Neural excitability and singular bifurcations, *Journal of Mathematical Neuroscience* **5** (16) (2015), 1–32.

¹Department of Mathematics and Statistics, Hasselt University, Agoralaan, gebouw D, 3590-Diepenbeek, Belgium
`peter.demaesschalck@uhasselt.be`

²School of Mathematics and Statistics, University of Sydney, NSW 2006, Australia
`wm@maths.usyd.edu.au`