

13th Symposium on Recent Trends in the Numerical Solution of Differential Equations
ICNAAM 2020
18th International Conference of Numerical Analysis and Applied Mathematics
Rhodes (Greece), September 17–23, 2020.

Stiffness ratio and the diffusion of fake news

Raffaele D'Ambrosio¹, Serena Mottola², Beatrice Paternoster³

¹ *DISIM, University of L'Aquila, Via Vetoio - Loc. Coppito, 67100 L'Aquila (AQ), Italy. Tel.: 0862434724.*

² *Department of Economic and Legal Studies, University "Parthenope" of Naples, Italy.*

³ *Department of Mathematics, University of Salerno, Italy.*

Our lives have significantly been influenced by the birth of social networks. These platforms have made us part of networks sharing common interests, as well as members of groups constantly informed of what happens around us. Social media are certainly a tool by which people interact each other, but also a large reservoir of news. The veracity of the news we get from social networks is a relevant issue and, clearly, the spread of fake news is a problem requiring a special attention [2]. Mathematical modeling for the diffusion of fake news by differential problems has attracted the attention of many authors: the interested reader can refer, for instance, to [1, 3, 4] and references therein.

We analyze a SIR model to describe the diffusion of fictitious information in a given country and emphasize the role of the stiffness ratio that characterize differential problems modeling the diffusion of fake news. In particular, we propose the employ of the stiffness ratio in order to understand how fast is the transit of fake news in a given population, providing a numerical evidence supporting our approach, based on real data.

References

- [1] D.C. Brody, D.M. Meier, How to model fake news, arXiv:1809.00964 (2018).
- [2] S. Mottola, Fake news as social phenomena. Linguistic analysis and persuasion in hoax in Italian and Spanish, *Discurso & Sociedad*, to appear.
- [3] P. Khurana, D. Kumar, Sir Model for Fake News Spreading Through Whatsapp, in *Proceedings of 3rd International Conference on Internet of Things and Connected Technologies*, doi:10.2139/ssrn.3166095 (2018).
- [4] Z. Zhao *et al.*, Fake news propagates differently from real news even at early stages of spreading, *EPJ Data Science* 9:7 (2020).