

## BLOWING-UP SOLUTIONS AND GLOBAL SOLUTIONS TO A FRACTIONAL DIFFERENTIAL EQUATION

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*Abstract.* In this paper, we give a positive answer to a problem posed by Nakagawa, Sakamoto and Yamamoto concerning a nonlinear equation with a fractional derivative.

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### REFERENCES

- [1] A. A. KILBAS, H. M. SRIVASTAVA AND J. J. TRUJILLO, *Theory and Applications of Fractional Differential Equations*, Elsevier, 2006.
- [2] M. KIRANE AND S. A. MALIK, *The profile of blowing-up solutions to a nonlinear system of fractional differential equations*, *Nonlinear Anal.* **73** (2010) 3723–3736.
- [3] M. KIRANE AND N.-E. TATAR, *Convergence Rates for a Reaction-Diffusion System*, *J. Math. Anal. Appl.* **20** (2001) 347–357.
- [4] C. M. KIRK, W. E. OLMSTEAD AND C. A. ROBERTS, *A System of Nonlinear Volterra Equations with Blow-up Solutions*, *J. Integral Equations Appl.* **25**, 3 (2013), 377–393.
- [5] A. M. KRÄGELOH, *Two families of functions related to the fractional powers of generators of strongly continuous contraction semigroups*, *J. Math. Anal. Appl.* **283** (2003) 459–467.
- [6] V. LAKSHMIKANTHAM, S. LEELA AND J. VASUNDHARA DEVI, *Theory of Fractional Dynamic Systems*, Cambridge Scientific Publishers, 2009.
- [7] J. NAKAGAWA, K. SAKAMOTO AND M. YAMAMOTO, *Overview to mathematical analysis for fractional diffusion equations – new mathematical aspects motivated by industrial collaboration*, *J. Math. Industry*, **2** (2010) 99–108.