

Accepted Manuscript

Field Sensitivity of Flow Predictions to Rheological Parameters

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PII: S0377-0257(18)30040-5
DOI: [10.1016/j.jnnfm.2018.03.013](https://doi.org/10.1016/j.jnnfm.2018.03.013)
Reference: JNNFM 3992



To appear in: *Journal of Non-Newtonian Fluid Mechanics*

Received date: 30 January 2018
Revised date: 16 March 2018
Accepted date: 20 March 2018

Please cite this article as: J.B. Freund, J. Kim, R.H. Ewoldt, Field Sensitivity of Flow Predictions to Rheological Parameters, *Journal of Non-Newtonian Fluid Mechanics* (2018), doi: [10.1016/j.jnnfm.2018.03.013](https://doi.org/10.1016/j.jnnfm.2018.03.013)

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Highlights

- A formulation is developed for efficiently computing the spatially dependent sensitivity of a quantity of interest in a flow to the parameters of a rheological model for the fluid.
- It is demonstrated for multiple rheological models.
- It is shown how the field sensitivity can be used for (1) quantifying the relative importance of different underlying physical mechanisms, (2) for directing rheological characterization to improve fidelity for a particular prediction, (3) for inferring rheological properties from indirect measurements, and (4) in aiding the design of fluids to meet objectives.

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