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Editorial

Editorial for Special Issue "Advances in Experimental and Computational Rheology, Volume II"

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Rheology, defined as the science of the deformation and flow of matter, is a multidisciplinary scientific field, covering both fundamental and applied approaches. The study of rheology includes both experimental and computational methods, which are not mutually exclusive. Its practical relevance embraces many daily life processes, like preparing mayonnaise, spreading an ointment, or shampooing, and industrial processes, like polymer processing and oil extraction, among several others. Practical applications also include formulation and product development.

Following a successful first volume, the Special Issue entitled "Advances in Experimental and Computational Rheology", the editorial team decided to launch a second volume.

The Special Issue "Advances in Experimental and Computational Rheology, Volume II" comprises 10 papers covering some of the latest advances in the fields of experimental and computational rheology, applied to a diverse class of materials and processes, which can be grouped into three main topics: rheology [1–5], rheometry and processing [6,7], and theoretical modeling [8–10].

The characterization of rheological behavior is the main topic of five contributions, covering the following materials/systems: S-aureus cultures (Portela et al. [1]), in which antibiotic activity was screened by rheometry; natural hydraulic lime grouts filled with polypropylene fibers (Baltazar et al. [2]), with a particular focus on the effect of the measurement methods on the obtained yield stress; wheat flour dough (Macedo et al. [3]), where rheology was used as a tool to study the impact of whey powder addition on the dough and breadmaking performance; human milk (Alatalo et al. [4]), covering the influence of external factors on its characteristics; and graphene oxide/poly(ethylene glycol) suspensions (Soares et al. [5]), where the authors studied the influence of the oxidation degree of graphene oxide on the suspensions' shear rheology.

Two of the Special Issue papers are dedicated to rheometry and processing. Ibañez et al. [6] analyzed the ability of different machine learning techniques, able to operate under a low data limit, to create a model linking material and process parameters with the properties and performances of parts obtained by reactive polymer extrusion. Parlato et al. [7] applied the so-called Couette analogy concept, in order to achieve a reduction in the complex, non-viscometric rotational geometry to a virtual concentric cylinder analogue, allowing for the determination of the flow curve of non-Newtonian fluids in complex geometries.

Theoretical modeling is the main topic of the remaining three works. The work of Lopéz Aguilar et al. [8] put forward a modeling framework that was experimentally validated, with a focus on the circular abrupt contraction flow of two highly elastic constant shear viscosity Boger fluids, with various contraction ratio geometries. Pedro et al. [9] numerically studied the filling stage of thermoplastic injection molding with a solver implemented in the open-source computational library OpenFOAM® and compared the new solver performance and accuracy with a proprietary code. In the

work of OIshi et al. [10], the authors studied the gravitational effects of elasto-viscoplastic drops colliding on vertical planes and proposed a classification for the observed behaviors.

Finally, it is very important to recognize and acknowledge the effort put forth by the large number of anonymous reviewers, which was essential to assuring the high quality of all the contributions of this Special Issue.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Portela, R.; Valcovo, F.; Almeida, P.L.; Sobral, R.G.; Leal, C.R. Antibiotic Activity Screened by the Rheology of S. aureus Cultures. *Fluids* **2020**, *5*, 76. [CrossRef]
2. Baltazar, L.G.; Henriques, F.M.A.; Cidade, M.T. Effects of Polypropylene Fibers and Measurement Methods on the Yield Stress of Grouts for the Consolidation of Heritage Masonry Walls. *Fluids* **2020**, *5*, 53. [CrossRef]
3. Macedo, C.; Nunes, M.C.; Sousa, I.; Raymundo, A. Rheology Methods as a Tool to Study the Impact of Whey Powder on the Dough and Breadmaking Performance of Wheat Flour. *Fluids* **2020**, *5*, 50. [CrossRef]
4. Alatalo, D.; Hassanipour, F. An Experimental Study on Human Milk Rheology: Behavior Changes from External Factors. *Fluids* **2020**, *5*, 42. [CrossRef]
5. Soares, Y.C.F.; Cargnin, E.; Naccache, M.F.; Andrade, R.J.E. Andrade. Influence of Oxidation Degree of Graphene Oxide on the Shear Rheology of Poly(ethylene glycol) Suspensions. *Fluids* **2020**, *5*, 41. [CrossRef]
6. Ibañez, R.; Casteran, F.; Argerich, C.; Ghnatios, C.; Hascoet, N.; Ammar, A.; Cassagnau, P.; Chinesta, F. On the Data-Driven Modeling of Reactive Extrusion. *Fluids* **2020**, *5*, 94. [CrossRef]
7. Parlato, R.M.; Russo, E.R.; Läuger, J.; Costanzo, S.; Vanzanella, V.; Grizzuti, N. On the Use of the Coaxial Cylinders Equivalence for the Measurement of Viscosity in Complex Non-Viscometric, Rotational Geometries. *Fluids* **2020**, *5*, 43. [CrossRef]
8. López-Aguilar, J.E.; Tamaddon-Jahromi, H.R. Computational Predictions for Boger Fluids and Circular Contraction Flow under Various Aspect Ratios. *Fluids* **2020**, *5*, 85. [CrossRef]
9. Pedro, J.; Ramôa, B.; Nóbrega, J.M.; Fernandes, C. Verification and Validation of openInjMoldSim, an Open-Source Solver to Model the Filling Stage of Thermoplastic Injection Molding. *Fluids* **2020**, *5*, 84. [CrossRef]
10. Oishi, C.M.; Martins, F.P.; Thompson, R.L. Gravitational Effects in the Collision of Elasto-Viscoplastic Drops on a Vertical Plane. *Fluids* **2020**, *5*, 61. [CrossRef]