Abstract Submitted
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Proper orthogonal decomposition of viscoelastic liquid jets. LOUISE COTTIER, MARIE-CHARLOTTE RENOULT, CORIA-UMR 6614 INSA Rouen Normandy, CHRISTOPHE DUMOUCHEL, CORIA-UMR 6614 CNRS — Proper Orthogonal Decomposition (POD) is a linear procedure that allows to identify characteristics of a data set by determining an optimized set of function basis. The optimization of that new basis is achieved by maximizing the projection of the data set on it. POD therefore depends on the choice of the scalar product. In the field of fluid dynamics, POD has been mostly applied to single phase turbulent flows, using the classical Euclidean scalar product. Here, we apply POD to a two-phase laminar flow: a low-velocity viscoelastic liquid jet evolving in an inert gas. More precisely, the procedure is applied to the interface between the two phases, and the scalar product is sought in the aim of tracking the jet surface evolution. After a brief presentation of the POD concept, we will describe the operating of our POD procedure on viscoelastic liquid jet images obtained from our experiments. Then, the results regarding pattern identification will be exposed. Finally, we will state what kind of physical information POD could bring about an atomization process involving viscoelasticity.

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