Have you ever listened to the sound of the fluid?

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ABSTRACT

Conventional rheometry does not help to understand what really happens inside because the flow is highly nonuniform and fluctuating, and it is hardly possible to read the signals from the equipment and sensors. But apparently the fluid tells us how they get stressed and how they feel. To control the process, we need to hear what they say and have to respond. This has never been possible, but we have to find the ways anyhow. Good news is that we now have the tools of machine learning. We have two approaches; one top-down and the other bottom-up. First, we develop the constitutive equation based on machine learning. Second, we understand what the fluid experiences from the signals of whatever. In this talk, I will briefly introduce the heterogenous nature of processing and show what it looks like. Then I will talk about our efforts to communicate with the fluid – small success and big challenges. I will also talk about a few issues and challenges we hopefully share and collaborate.