

Abstract Submitted
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Concentration and Velocity Measurements of Both Phases in Liquid-Solid Slurries STEPHEN ALTOBELLI, New Mexico Resonance, KIMBERLY HILL, University of Minnesota, ARVIND CAPRIHAN, New Mexico Resonance — Natural and industrial slurry flows abound. They are difficult to calculate and to measure. We demonstrate a simple technique for studying steady slurries. We previously used time-of-flight techniques to study pressure driven slurry flow in pipes. Only the continuous phase velocity and concentration fields were measured. The discrete phase concentration was inferred. In slurries composed of spherical, oil-filled pills and poly-methyl-siloxane oils, we were able to use inversion nulling to measure the concentration and velocity fields of both phases. Pills are available in 1-5mm diameter and silicone oils are available in a wide range of viscosities, so a range of flows can be studied. We demonstrated the technique in horizontal, rotating cylinder flows. We combined two tried and true methods to do these experiments. The first used the difference in T1 to select between phases. The second used gradient waveforms with controlled first moments to produce velocity dependent phase shifts. One novel processing method was developed that allows us to use static continuous phase measurements to reference both the continuous and discrete phase velocity images. ?

Stephen Altobelli
New Mexico Resonance

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