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Dynamics of Liquid-Liquid Flows in Horizontal Pipes Using Simultaneous Two-Line Planar Laser-Induced Fluorescence and Particle Velocimetry

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**Highlights**

- Simultaneous two-line (one per phase) PLIF-PI/TV applied to stratified oil-water pipe flows
- Normalised mean velocity profiles collapse in the water phase but not in the oil phase
- Laminar and turbulent velocity profiles modified by vertical velocity components
- Turbulence intensity peaks close to the pipe wall and at the liquid-liquid interface
- Mixing length model with the von Karman constant agrees reasonably well with data

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