

## **PIV Measurements of the Instantaneous Velocities for Single and Two-Phase Flows in an Annular Duct**

**Authors :** Marlon M. Hernández Cely, Victor E. C. Baptistella, Oscar M. H. Rodríguez

**Abstract :** Particle Image Velocimetry (PIV) is a well-established technique in the field of fluid flow measurement and provides instantaneous velocity fields over global domains. It has been applied to external and internal flows and in single and two-phase flows. Regarding internal flow, works about the application of PIV in annular ducts are scanty. An experimental work is presented, where flow of water is studied in an annular duct of inner diameter of 60 mm and outer diameter of 155 mm and 10.5-m length, with the goal of obtaining detailed velocity measurements. Depending on the flow rates of water, it can be laminar, transitional or turbulent. In this study, the water flow rate was kept at three different values for the annular duct, allowing the analysis of one laminar and two turbulent flows. Velocity fields and statistic quantities of the turbulent flow were calculated.

**Keywords :** PIV, annular duct, laminar, turbulence, velocity profile

**Conference Title :** ICSRD 2020 : International Conference on Scientific Research and Development

**Conference Location :** Chicago, United States

**Conference Dates :** December 12-13, 2020