

Abstract Submitted
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Measurement of turbulent flow upstream and downstream of a circular pipe bend JUN SAKAKIBARA, NOBUTERU MACHIDA, Department of Engineering Mechanics and Energy, University of Tsukuba — We measured velocity distribution in cross sections of a fully developed turbulent pipe flow upstream and downstream of a 90-degree bend by synchronizing two sets of a particle image velocimetry (PIV) system. Unsteady undulation of Dean vortices formed downstream from the bend was characterized by the azimuthal position of the stagnation point found on the inner and outer sides of the bend. Linear stochastic estimation (LSE) was applied to capture the upstream flow field conditioned by the azimuthal location of the stagnation point downstream from the bend. When the inner-side stagnation point stayed below (above) the symmetry plane, the conditional streamwise velocity upstream from the bend exhibited high-speed streaks extended in a quasi-streamwise direction on the outer side of the curvature above (below) the symmetry plane. Similarity of the estimated structure and the very large scale motion (VLSM) will be presented.

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