

Abstract Submitted  
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**Time-resolved PIV in fully developed turbulent pipe flow** LEO HELLSTROEM, ALEXANDER SMITS, Princeton University — Stereoscopic particle image velocimetry was used to study the three component flowfield in both fully developed turbulent pipe flow and at several locations downstream of a horizontal  $90^\circ$  bend. The data was acquired with a high speed camera, making it possible to resolve the flow field in time for Reynolds numbers up to  $35'000$ . The secondary motions downstream the bend appears to be governed by either a Dean type motion were two swirls with opposite signs coexists, one in the upper and one in the lower half of the pipe respectively. Or a motion where two swirls, as large as the pipe, with opposite sings are alternating between each other. Both motions are present at the same Reynolds numbers, but the unsteady behavior appears to be more common for higher Reynolds numbers.

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