

Abstract Submitted  
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**Vertical Position and Current Profile Measurements by Faraday-effect Polarimetry On EAST tokamak** WEIXING DING, Univ of California - Los Angeles, H.Q. LIU, Y.X. JIE, IPP CAS China, D.L. BROWER, Univ of California - Los Angeles, J.P. QIAN, Z.Y. ZOU, H. LIAN, S.X. WANG, Z.P. LUO, B.J. XIAO, IPP CAS China, UCLA TEAM, ASIPP TEAM — A primary goal for ITER and prospective fusion power reactors is to achieve controlled long-pulse/steady-state burning plasmas. For elongated divertor plasmas, both the vertical position and current profile have to be precisely controlled to optimize performance and prevent disruptions. An eleven-channel laser-based **P**olarimeter-**I**NTerferometer (POINT) system has been developed for measuring the internal magnetic field in the EAST tokamak and can be used to obtain the plasma current profile and vertical position. Current profiles are determined from equilibrium reconstruction including internal magnetic field measurements as internal constraints. Horizontally-viewing chords at/near the mid-plane allow us to determine plasma vertical position non-inductively with subcentimeter spatial resolution and time response up to 1  $\mu$ s. The polarimeter-based position measurement, which does not require equilibrium reconstruction, is benchmarked against conventional flux loop measurements and can be exploited for feedback control. Work supported by US DOE through grants *DE-FG02-01ER54615 and DC-SC0010469*.

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