

Abstract Submitted
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Investigation of plasma turbulence and geodesic acoustic modes using tangential phase-contrast imaging in the TCV tokamak ZHOUI HUANG, STEFANO CODA, GABRIELE MERLO, STEPHAN BRUNNER, LAURENT VILLARD, Ecole Polytechnique Federale de Lausanne (EPFL), Centre de Recherches en Physique des Plasmas (CRPP), CH-1015 Lausanne, Switzerland — A tangential phase-contrast imaging (TPCI) diagnostic has been installed on the Tokamak à Configuration Variable (TCV) to measure plasma density fluctuations; by employing a spatial filtering technique, radially localized measurement can be performed from core plasma to the edge. The dependence of turbulence on plasma shape and radial position has been investigated, especially in the core region where local triangularity is vanishingly small. The measurements show a substantial reduction of turbulence amplitude from positive to negative triangularity, consistent with experimental observation of transport reduction on TCV and with non-linear gyrokinetic simulations. In addition, TPCI also measures the density component of the geodesic acoustic modes (GAM). The radial structure of GAM has been characterized in both single-frequency eigenmode and multi-mode regimes. Parametric studies were performed to investigate the dependence of GAM frequency, wavenumber, amplitude as well as GAM-turbulence interactions.

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