Abstract Submitted
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Mechanisms of intrinsic toroidal rotation tested against ASDEX Upgrade observations WILLIAM HORNSBY, CLEMENTE ANGIONI, EMILIANO FABLE, PIERRE MANAS, RACHAEL MCDERMOTT, Max-Planck-Institute for Plasma Physics, ARTHUR PEETERS, University of Bayreuth, ASDEX UPGRADE TEAM — One of the major current challenges in the theory of tokamak turbulent transport is the quantitative prediction of intrinsic toroidal rotation. Symmetry breaking mechanisms connected with plasma rotation and with higher order effects must be included in the theoretical description of this transport channel. Many have been identified, however a systematic comparison of their predicted size against a comprehensive set of observations is largely missing. Presented will be a combined theoretical and experimental effort. The gyrokinetic code GKW has been increasingly upgraded to include the most important symmetry breaking mechanisms. Comparison is made to dedicated ASDEX Upgrade experiments which provide a database of 190 observations in Ohmic plasmas; an optimal test-bed to perform a comprehensive and systematic comparison of the predictions of many mechanisms against observations. The sum of the symmetry breaking mechanisms used in the local code, including neoclassical background flow effects, predicts mostly hollow rotation profiles, as observed, but rotation gradients have much smaller amplitudes. Larger flow gradients caused by profile shearing are found in global turbulence simulations with kinetic electrons, their reversal and parametric dependency will be discussed

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