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Simulation of the internal kink-like mode driven by the toroidal rotation in spherical tokamak G.Z. HAO, W.W. HEIDBRINK, D. LIU, UC,Irvine, Y.Q. LIU, GA, M. PODESTA, E. FREDRICKSON, D. DARROW, PPPL, N. CROCKER, UCLA, K. TRITZ, JHU — Based on the L-mode discharge of NSTX, the linear simulation indicates that the internal kink-like mode can be driven by the toroidal rotation when it exceeds 25% of Alfven velocity at magnetic axis. The predicted critical value of rotation is close to the experimental rotation at the onset of the mode. The mode frequency agrees well with the measured value (˜35 kHz). The simulated mode structure agrees with the measurement from reflectometer diagnostic which monitors the major radius larger than 120cm for the studied case. Furthermore, in simulation, the triggering of the mode is robust and insensitive to uncertainty in the reconstructed equilibrium. The preliminary analysis of soft-x ray data suggests that the mode perturbation initially occurs in the core and moves outside during the frequency chirping process of the mode. A comparison between the simulated soft-x ray and the experiment measurement in the core region will be presented. This work is supported by the US DOE under Grant Nos. DE-AC02-09CH11466, DE-FG02-06ER54867, and DE-FG03-02ER54681

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