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Influence of error field on resistive tearing mode in Tokamak S. S. LU, Y. LIU, Dalian University of Technology, Z. W. MA, H. W. ZHANG, Zhejiang University — The influence of error field on the $m/n = 2/1$ resistive tearing mode is studied numerically using the three-dimensional toroidal code (CLT) based on a set of full magnetohydrodynamics equations. It is found that there is a threshold of the error field to achieve mode penetration, which depends on the plasma rotation. The saturated magnetic island width increases with the increasing strength of the error field once the mode penetration occurs, but stays almost the same when the error field is under the threshold of mode penetration. Moreover, the magnetic island can be locked to the error field in the nonlinear stage by a large amplitude of error field. The locking threshold significantly increases with the increasing mode frequency. The onset time of mode locking is negatively related to the amplitude of the error field for the same plasma rotation frequency. It is also found that there is an unlocking threshold, which is lower than the locking threshold and determined by the width of magnetic island and the mode frequency.

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