

Abstract Submitted  
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**Influence of ion orbit width on onset threshold of neoclassical tearing modes** HUIZHAN CAI, University of Science and Technology of China, DING LI, JINTAO CAO, Institute of Physics, CAS — The onset threshold of neoclassical tearing modes with finite ion orbit width is studied. The evolution of neoclassical tearing modes including the effect of ion orbit is derived analytically. When ion orbit width is comparable to island width, the effect of ion orbit is significant. It would increase the island width needed to flatten pressure in the island, and reduce the amplitude of ion perturbed bootstrap current. It is found that ion orbit effect tends to increase the onset threshold  $\beta_{\theta}^{onset}$  for a given seed island. It also would increase the lowest threshold  $\beta_{\theta, \min}$  and the corresponding marginal island width. It has an important implications for the onset of neoclassical tearing modes with comparable ion orbit width and island width in ITER.

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