

Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Study of transition between even and odd toroidal Alfvén eigenmodes on EAST using NIMROD¹ Yawei Hou, University of Science and Technology of China, Charlson Kim, SLS2 Consulting, Ping Zhu, Huazhong University of Science and Technology, University of Wisconsin-Madison, Zhihui Zou, University of Science and Technology of China, Youjun Hu, CAS Institute of Plasma Physics, Xingting Yan, University of Science and Technology of China — Linear simulations of toroidal Alfvén eigenmodes (TAEs) driven by energetic particles (EPs) on EAST are performed using the hybrid-kinetic MHD model implemented in the NIMROD code. The "slowing down" distribution is adopted for modeling the equilibrium distribution of the energetic ions from the deuterium neutral beam injection on EAST. The frequency, the dominant poloidal mode number, the radial location, and the detailed 2D mode structure of the TAE/RSAE/EPM modes are consistent between the eigenvalue analysis and the NIMROD calculation. As the EP β fraction increases, a transition between even and odd TAEs occurs, along with that between the ballooning and anti-ballooning mode structures. When the EP β fraction is close to the transition threshold, both types of TAEs coexist.

¹Supported by the National Natural Science Foundation of China grant No. 11875253, the Fundamental Research Funds for the Central Universities under Grant Nos. WK3420000004 and 2019kfyXJJS193, the National Magnetic Confinement Fusion Science Program of China under Grant Nos. 2014GB124002 and 2015GB101004.

Xingting Yan
University of Science and Technology of China

Date submitted: 03 Jul 2019

Electronic form version 1.4