Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

**Peeling-Ballooning mode simulation in "Snowflake" divertor configuration using BOUT++** JINGFEI MA, Institute for Fusion Studies and Lawrence Livermore National Laboratory, XUEQIAO XU, DMITRI RYUTOV, MAXIM UMANSKY, Lawrence Livermore National Laboratory — "Snowflake" divertor, one of the two innovative divertor concepts [1,2], was introduced to solve the issue of large heat loads on plasma facing components and the resulting material erosion, especially during ELMing H-mode, by spreading particle flux to two additional divertor plates. In our work, two-fluid code BOUT++ is used to conduct linear peeling-ballooning (P-B) mode simulations in both standard (SD) and snowflake (SF) divertor geometry generated from DIII-D ELMing H-mode equilibrium. The purpose of this work is to explore how the changes of edge magnetic topology due to implementation of SF geometry will affect P-B mode instabilities. The results are: (1) Linear P-B mode behaviors are greatly affected by magnetic shear at outer middle plane. The growth rate in SF geometry is larger due to the smaller local magnetic shear. (2)Due to the smaller local shear, global mode structures are more strongly ballooning (more radially extended yet less poloidally extended) in SF geometry for moderate toroidal mode numbers. (3) Diamagnetic drift provides stabilizing effects on P-B mode in SF geometry, but not in SD geometry.

[1] M.Kotschenreuther et al., 2004 IAEAFEC. IC/P6-43
[2] D.D. Ryutov, PHYSICS OF PLASMAS 14, 064502 (2007)

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Date submitted: 12 Jul 2013 Electronic form version 1.4