

Simulations of Global Stability in the C-2W device

Topic Area:
ModSim

Partner	Company
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Project Summary:

The hybrid PIC code HYM was used to study global stability of FRC plasmas in conditions relevant to TAE's C-2W experiment. A low-order compressional mode was found in simulation and explained with a reduced theoretical model. In conditions relevant to the C-2W experiment it is an $n=2$ mode, driven by neutral beam injection, saturating at low amplitude due to kinetic effects of thermal ions. It is a good candidate to explain a "microburst" mode observed in experiment [1] which was an $n=2$ mode, driven by neutral beam injection, that saturated at low amplitude.

Fusion Impact:

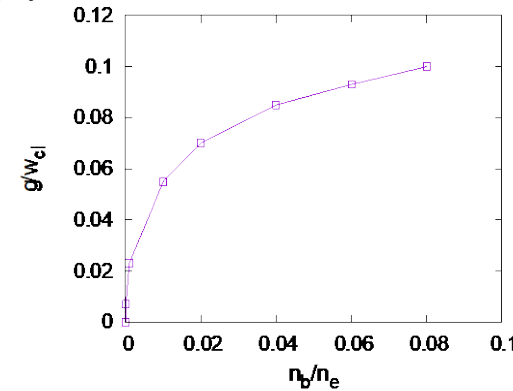
This work assists with scientific understanding of experimental observations and extrapolation of behavior to next step device.

Business/Market Impact:

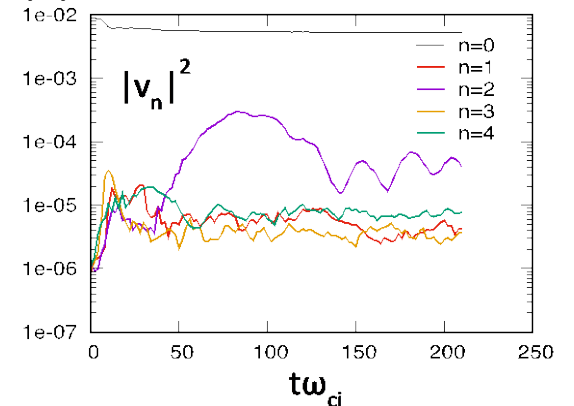
Better understanding of next step device reduces technical and financial risk.

Key figures

(a)



(b)



(a) Linear growth rate of $n=2$ mode vs normalized beam ion density

(b) Mode saturates non-linearly at small amplitude when thermal ions are treated kinetically

Period of
Performance:

06/2020-08/2021

Federal Share:

\$242K

Cost Share:

\$50K