

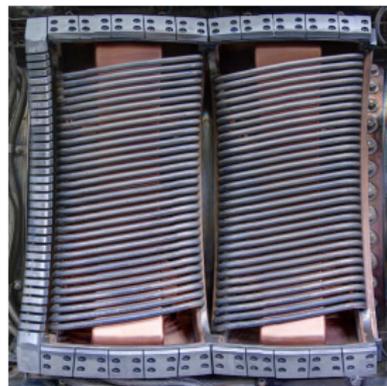
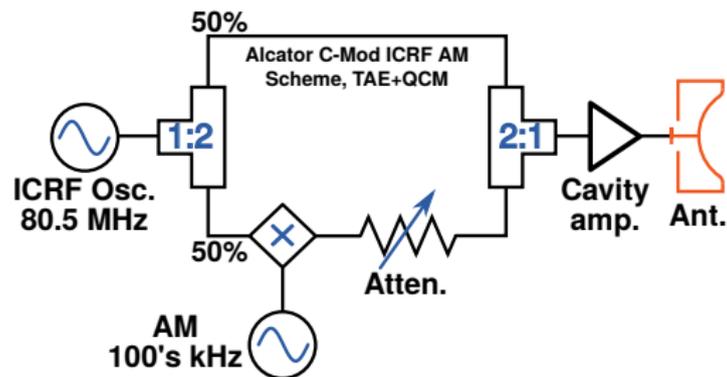
Coupling to Plasma Fluctuations Using Amplitude Modulation of RF Antennas: A Shortcut to Driving the EHO?

T. Golfinopoulos*, B. LaBombard**, R. Goldston†, S. Wukitch, G. Wallace, Y. Lin, J.L. Terry, R.R. Parker, D. Brunner, W. Burke, J.W. Hughes, and the Alcator C-Mod team,
Plasma Science and Fusion Center, MIT
*golfit@mit.edu, **labombard@psfc.mit.edu
†Princeton Plasma Physics Laboratory

AM on HHFW to Excite EHO

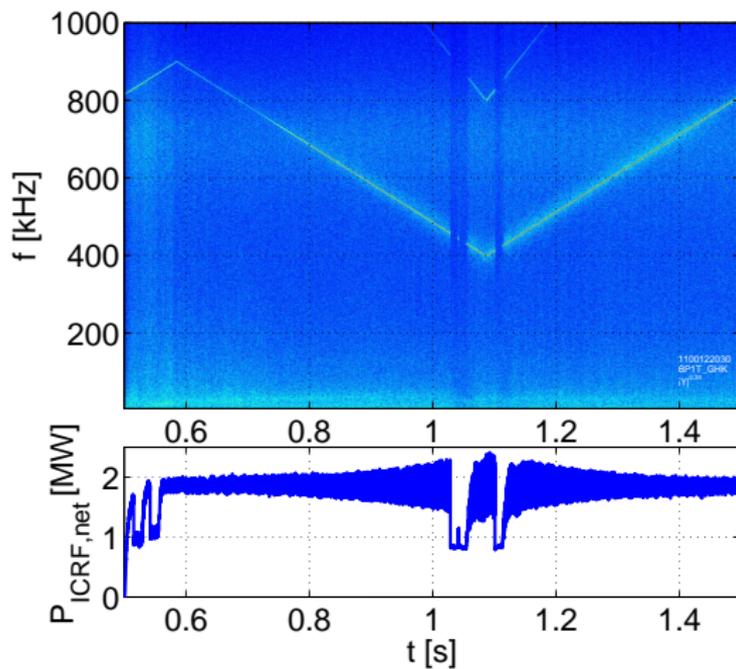
- ▶ EHO observed on NSTX; proposals to pump mode at mode freq. using HHFW straps and modified power sys. [Park *et al.* 2014]
- ▶ Before hardware changes, can explore coupling to mode using HHFW AM
- ▶ Technique has been used on Alcator C-Mod with ICRF and LH antennas in attempts to couple to Alfvén eigenmodes and QCM

AM on ICRF



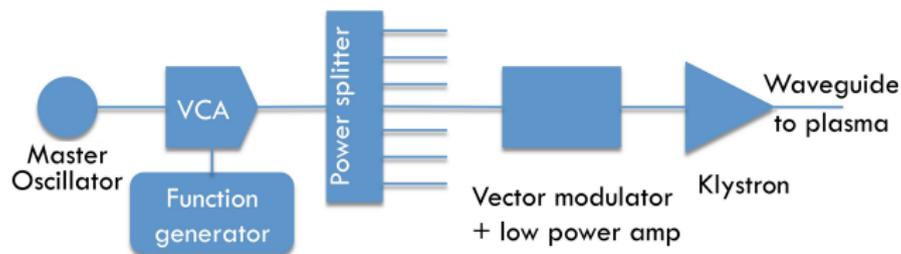
- ▶ Experiments with ICRF AM begun in 2010, targeted TAE, QCM
- ▶ JET: coupled to TAE's by beating two ICRF antennas [Fasoli *et al.* 1996]
- ▶ C-Mod developed AM technique for use with any single antenna with sufficient bandwidth [Golfonopoulos *et al.* 2010]

AM on ICRF



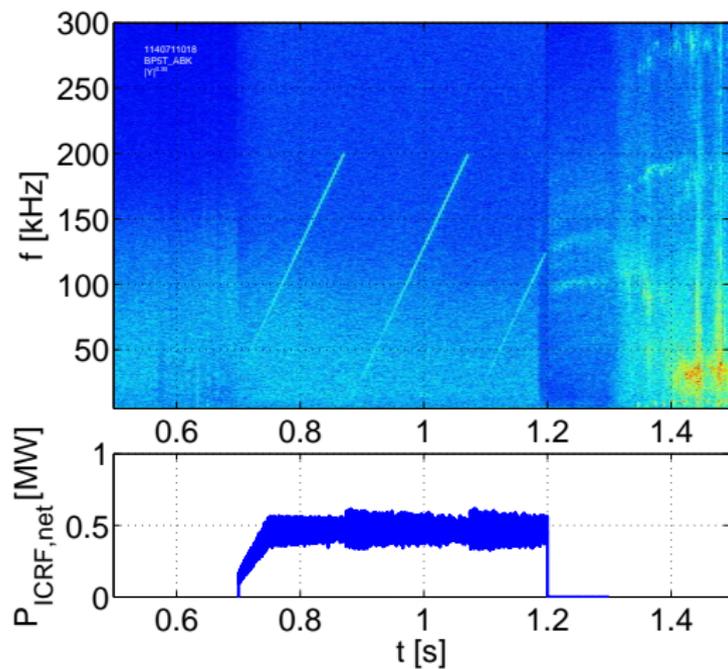
- ▶ Spectrogram of Mirnov coil signal showing component at ICRF AM freq.

AM on LH



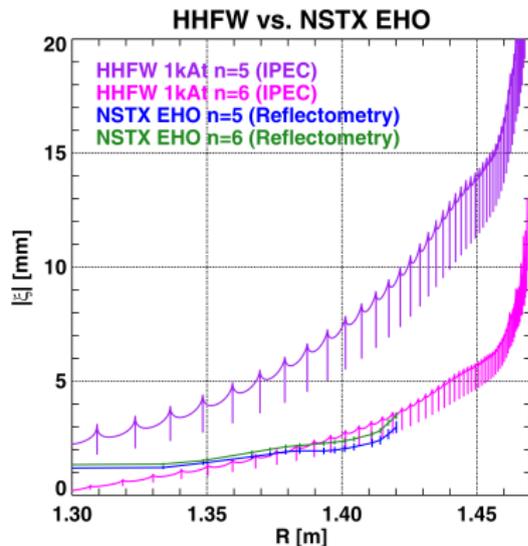
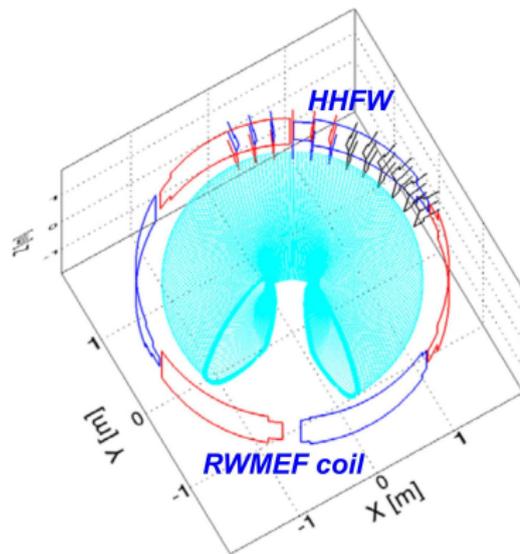
- ▶ LH has profound impact on QCM spectral properties [Terry *et al.* 2014]
- ▶ AM at f_{QCM} may allow antenna to drive mode in similar manner to Shoelace ant.
- ▶ Early experiments toward this end already attempted [Wallace *et al.* 2014]

AM on LH



- ▶ Spectrogram of Mirnov coil signal showing component at LH AM freq.

Driving EHO on NSTX-U



- ▶ Park *et al.* (2014): exploratory study for pumping EHO with HHFW driven directly at EHO freq.; experiments projected for 2017-2018+ in NSTX-U 5-year plan
- ▶ AM can allow nearer-term exploration on this topic (though may yield different results from direct drive)