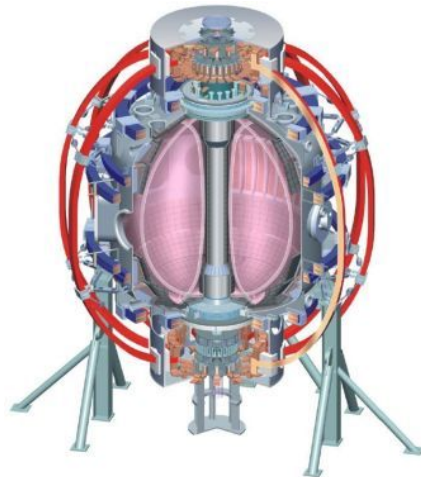


# Measurement of Density fluctuation at HHFW frequency using FReTIP

**KC Lee, Jeehyun Kim**

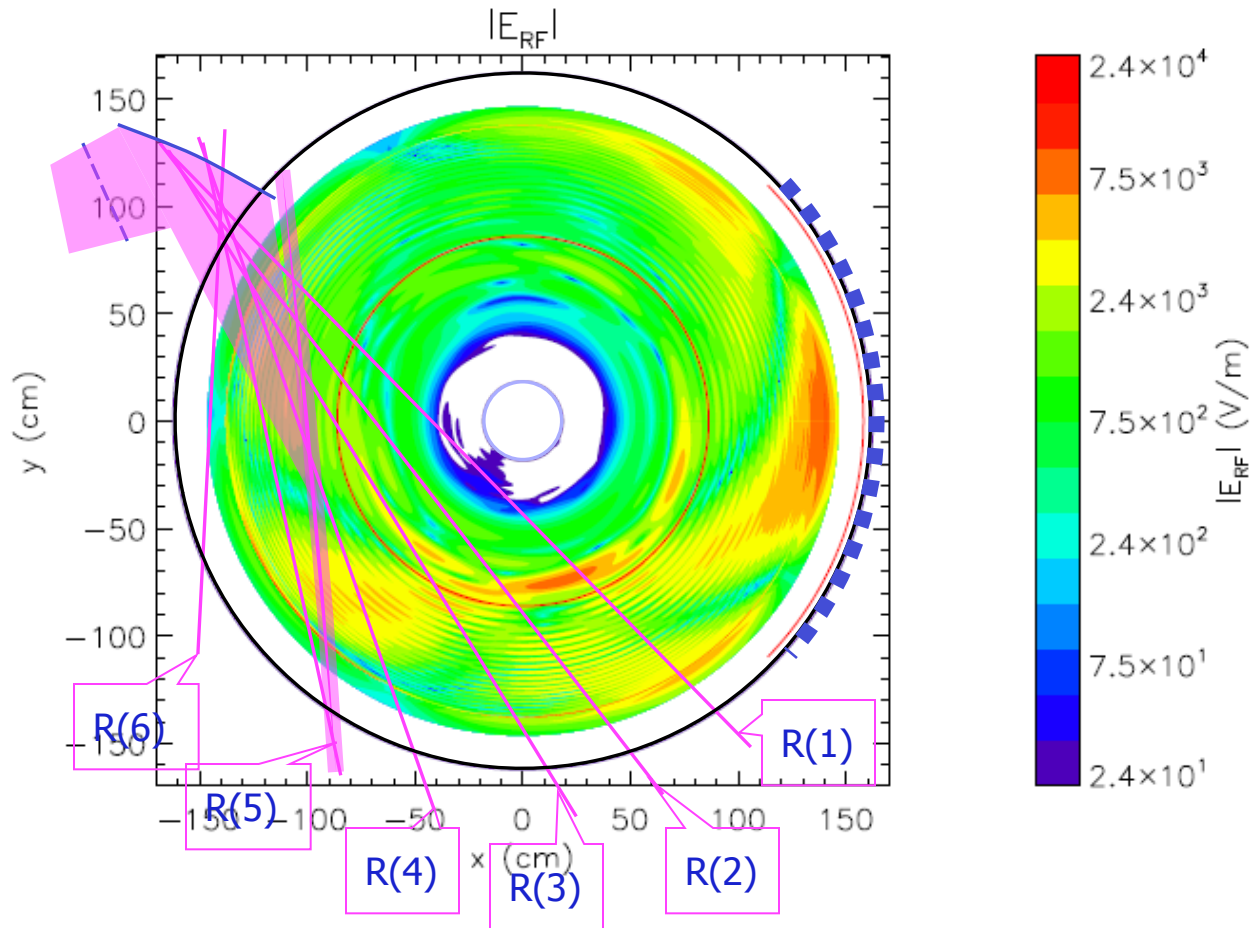
**April. 29, 2010**

College W&M  
Colorado Sch Mines  
Columbia U  
CompX  
General Atomics  
INEL  
Johns Hopkins U  
LANL  
LLNL  
Lodestar  
MIT  
Nova Photonics  
New York U  
Old Dominion U  
ORNL  
PPPL  
PSI  
Princeton U  
Purdue U  
SNL  
Think Tank, Inc.  
UC Davis  
UC Irvine  
UCLA  
UCSD  
U Colorado  
U Illinois  
U Maryland  
U Rochester  
U Washington  
U Wisconsin



Culham Sci Ctr  
U St. Andrews  
York U  
Chubu U  
Fukui U  
Hiroshima U  
Hyogo U  
Kyoto U  
Kyushu U  
Kyushu Tokai U  
NIFS  
Niigata U  
U Tokyo  
JAEA  
Hebrew U  
Ioffe Inst  
RRC Kurchatov Inst  
TRINITY  
KBSI  
KAIST  
POSTECH  
ASIPP  
ENEA, Frascati  
CEA, Cadarache  
IPP, Jülich  
IPP, Garching  
ASCR, Czech Rep  
U Quebec

# E field from TORIC & FIReTIP



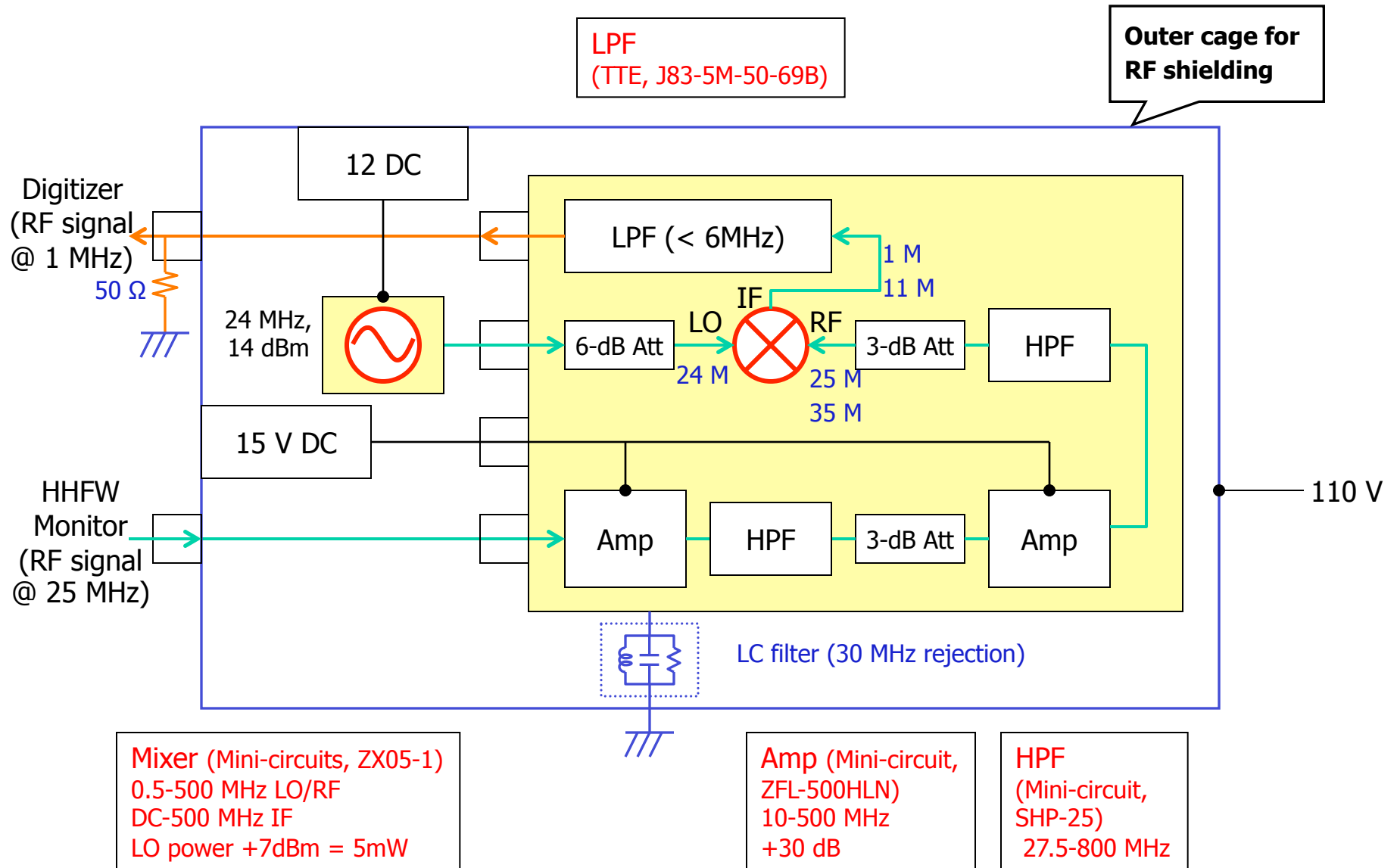
- Radius at tangential point

- R(1) = 32 cm
- R(2) = 57 cm
- R(3) = 85 cm
- R(4) = 118 cm
- R(5) = 132 cm
- R(6) = 150 cm

$$\tilde{n}_e = \frac{i}{\omega e} \nabla \cdot \tilde{\mathbf{J}}_e = \frac{\epsilon_0}{e} \nabla \cdot [\overline{\chi}_e \cdot \mathbf{E}]$$

E field from TORIC with equilibrium data of shot number 130608 and antenna phase angle = 180 °

# RF Amp and Frequency down mixing circuit



# FIReTIP status 2010

Bandwidth : 4 MHz

Sampling rate : 12 MHz

Channel # : up to 3; Ch1(32cm, high priority),  
Ch3(85 cm) & Ch5(118 cm) : additional

2010 Calibrated density data in NSTX tree (Tag names)

(experiment: MICROWAVE)

Ch1 (Rt=32 cm) , \den\_fast\_firetipc1

Ch3 (Rt=85 cm) , \den\_fast\_firetipc3

Ch5 (Rt=132 cm), \den\_fast\_firetipc5

Ch7 (Rt=150 cm), \den\_fast\_firetipc7

for data before 2010;

Ch1 (Rt=32 cm) , \den\_firetipc1

Ch2 (Rt=57 cm) , \den\_firetip

Ch3 (Rt=85 cm) , \den\_firetipc3

Ch4 (Rt=118 cm) , \den\_firetipc4

Ch5 (Rt=132 cm) , \den\_firetipc5

Ch7 (Rt=150 cm) , \den\_firetipc7