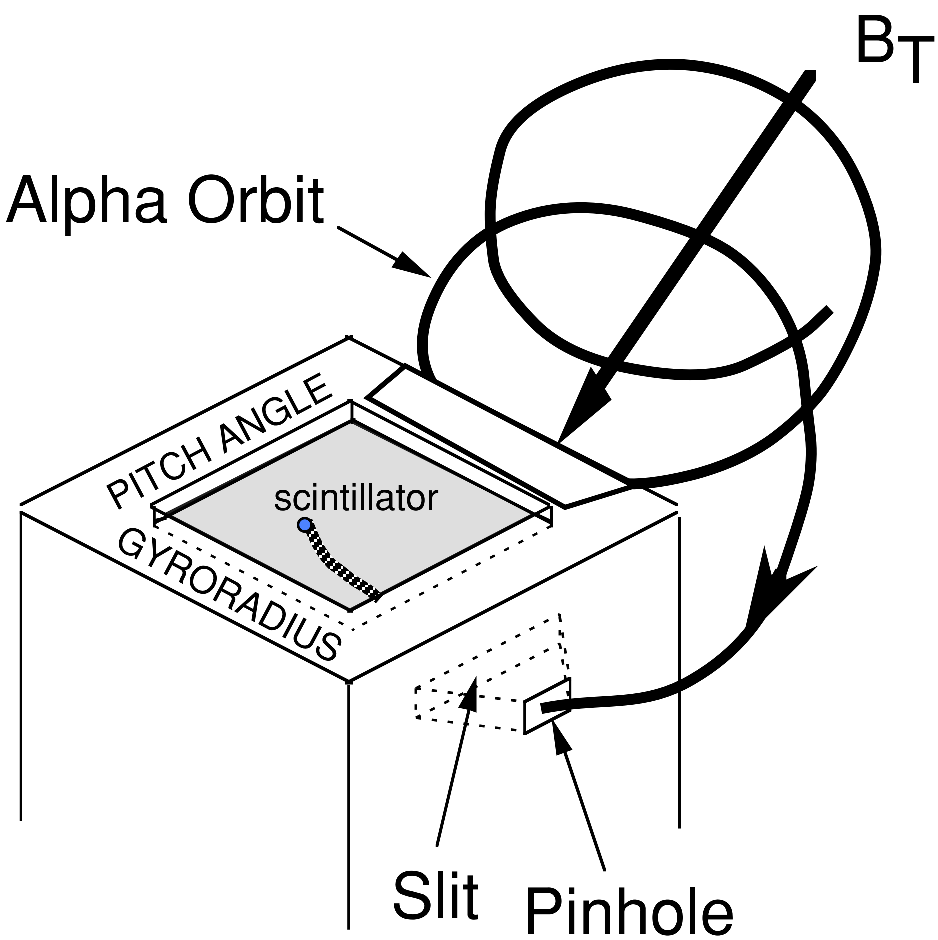
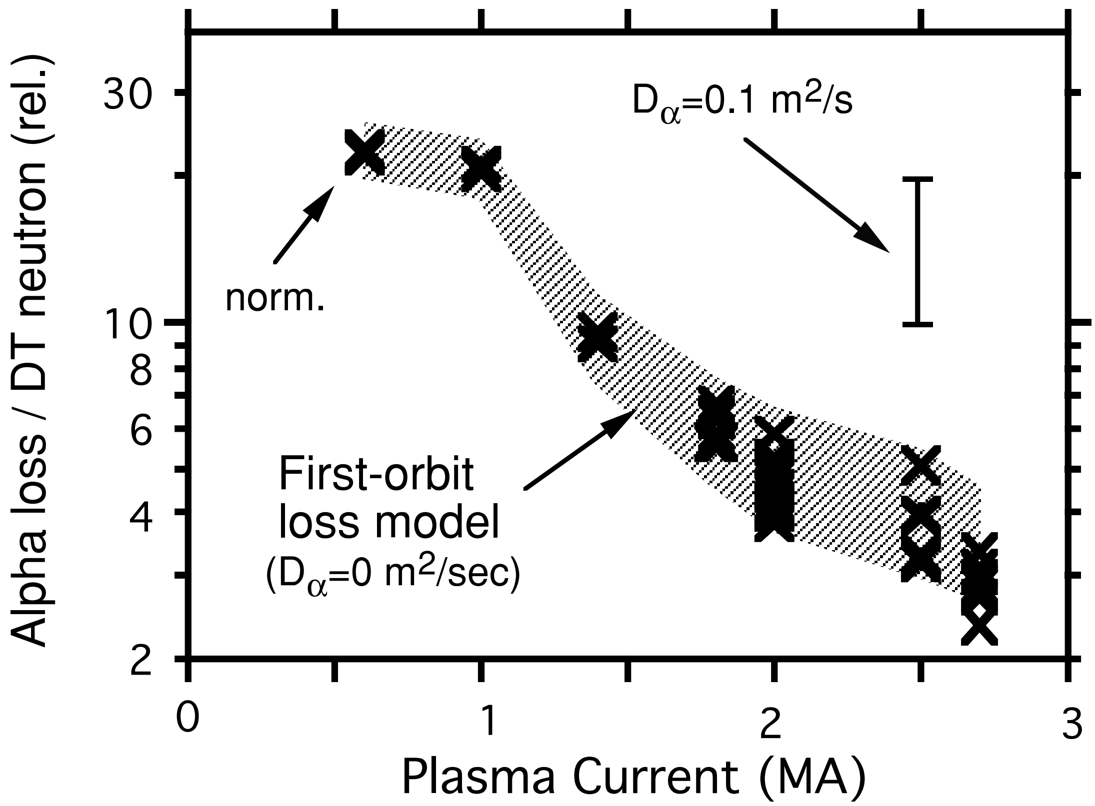


B_T
Alpha Orbit
PITCH ANGLE
scintillator
GYRORADIUS
Slit
Pinhole

Fig. 7



Alpha loss / DT neutron (rel.)
30
10
8
6
4
2
D_α=0.1 m^2/s
norm.
First-orbit loss model
(D_α=0 m^2/sec)
0
1
2
3
Plasma Current (MA)

Fig. 8

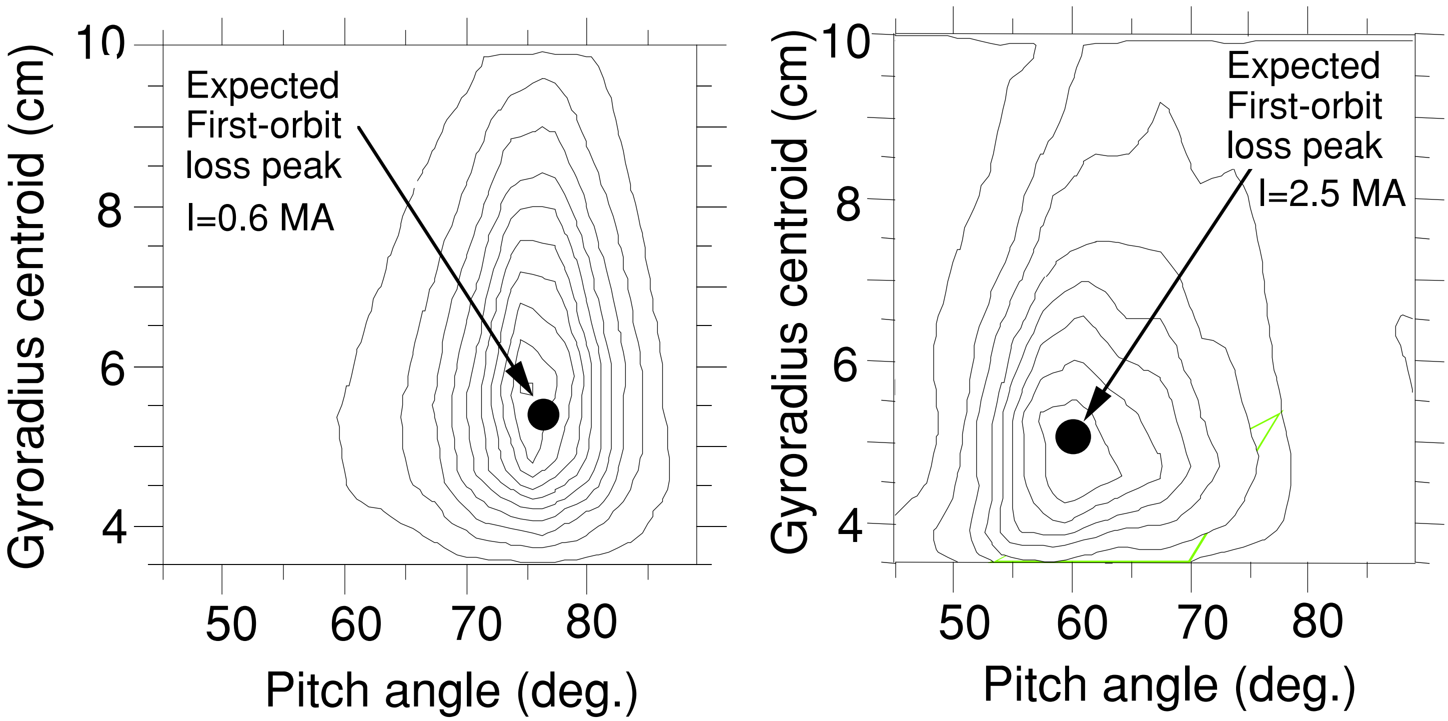

Gyroradius centroid (cm)
10
8
6
4
Expected
First-orbit
loss peak
I=0.6 MA
50
60
70
80
Pitch angle (deg.)
Gyroradius centroid (cm)
10
8
6
4
Expected
First-orbit
loss peak
I=2.5 MA
50
60
70
80
Pitch angle (deg.)

Fig. 9

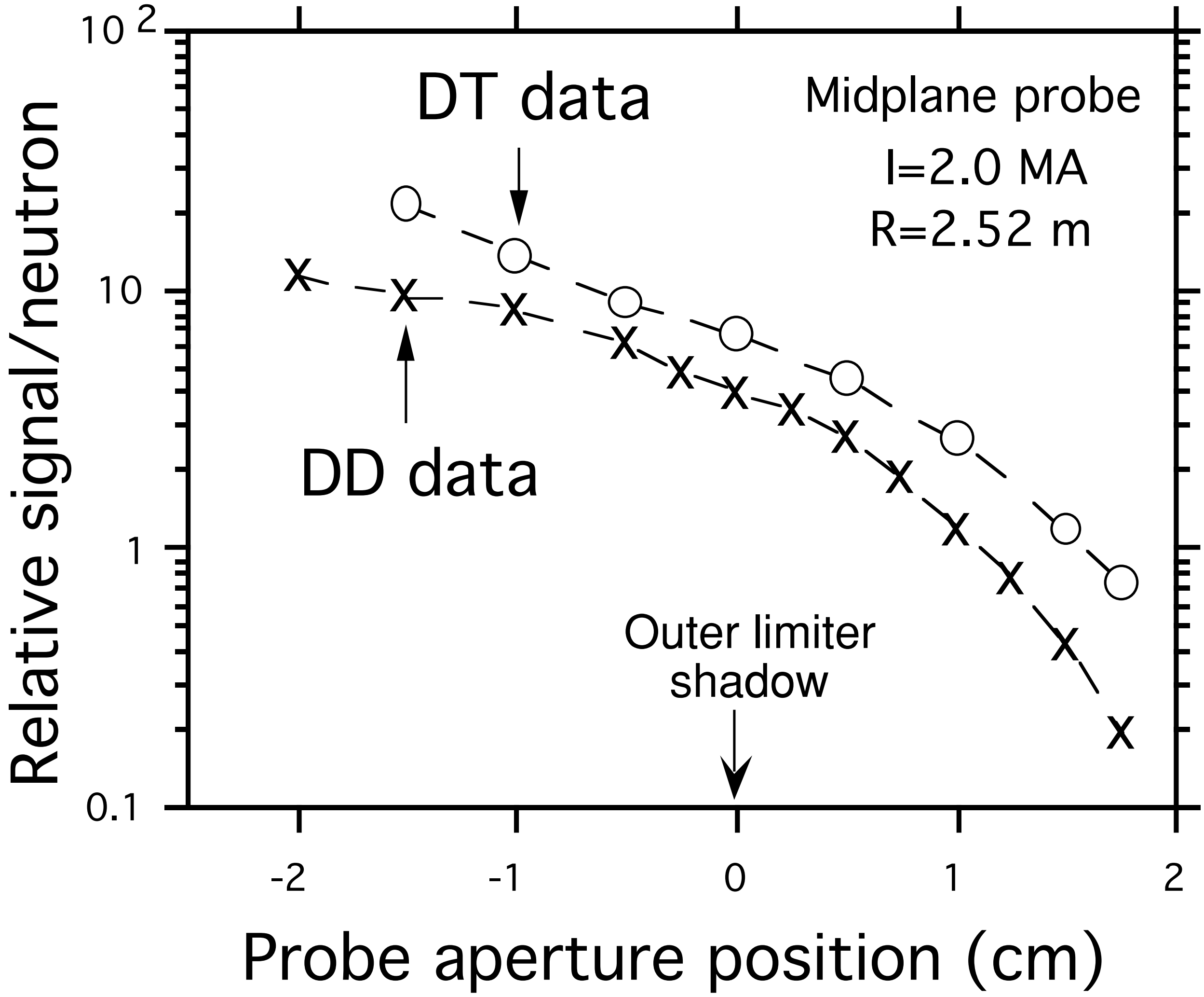
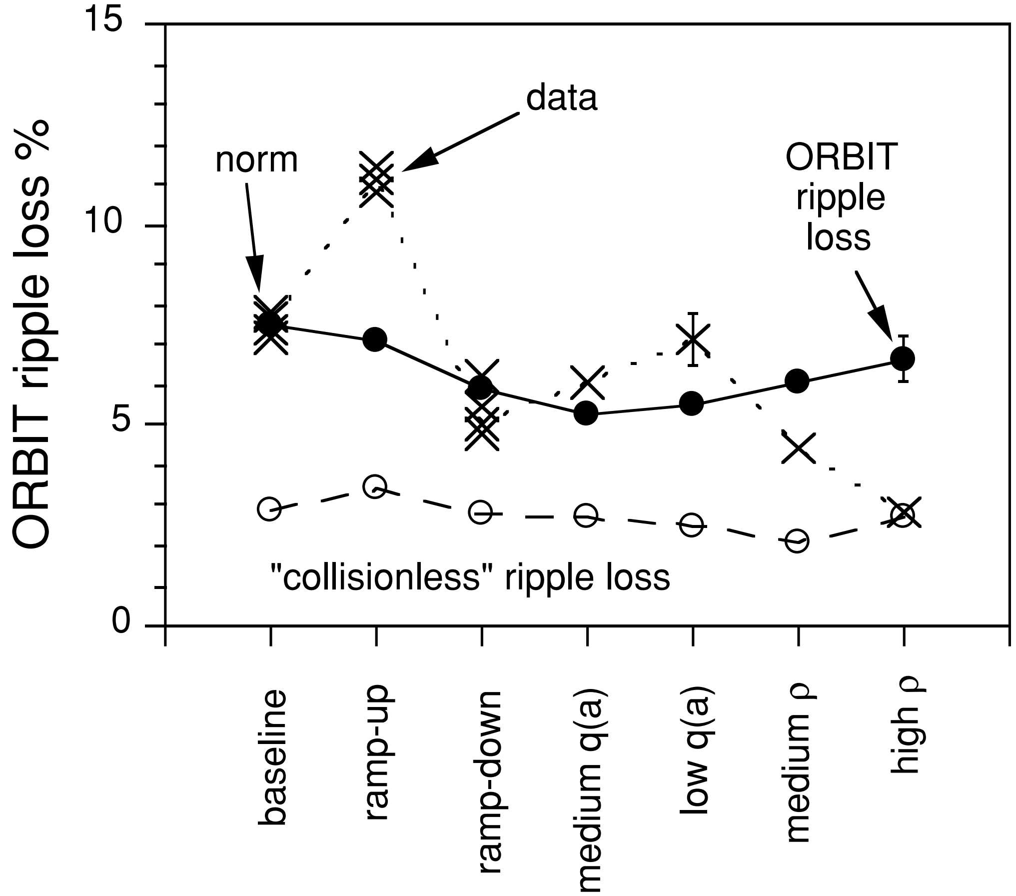
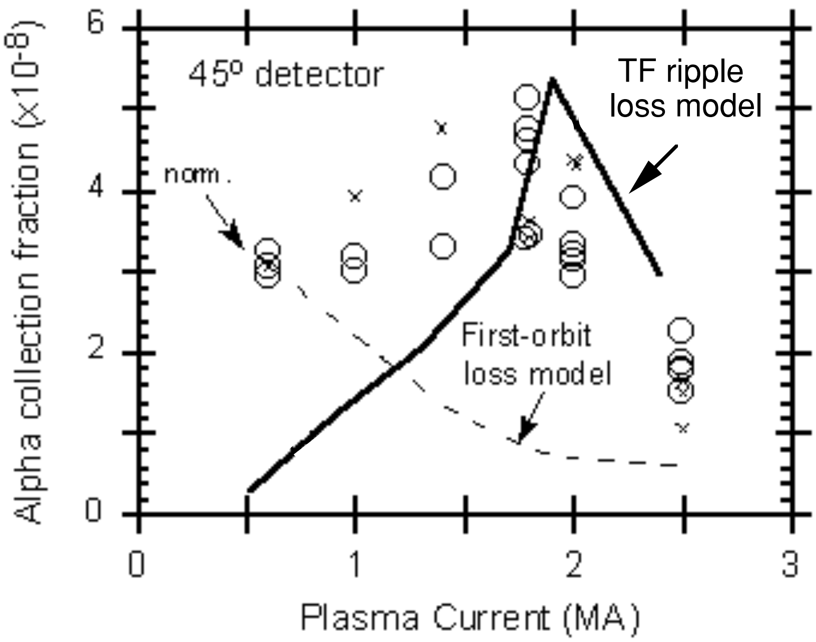

DT data
Midplane probe
I=2.0 MA
R=2.52 m
DD data
Outer limiter shadow
Relative signal/neutron
Probe aperture position (cm)
10 2
10
1
0.1
-2
-1
0
1
2

Fig. 10



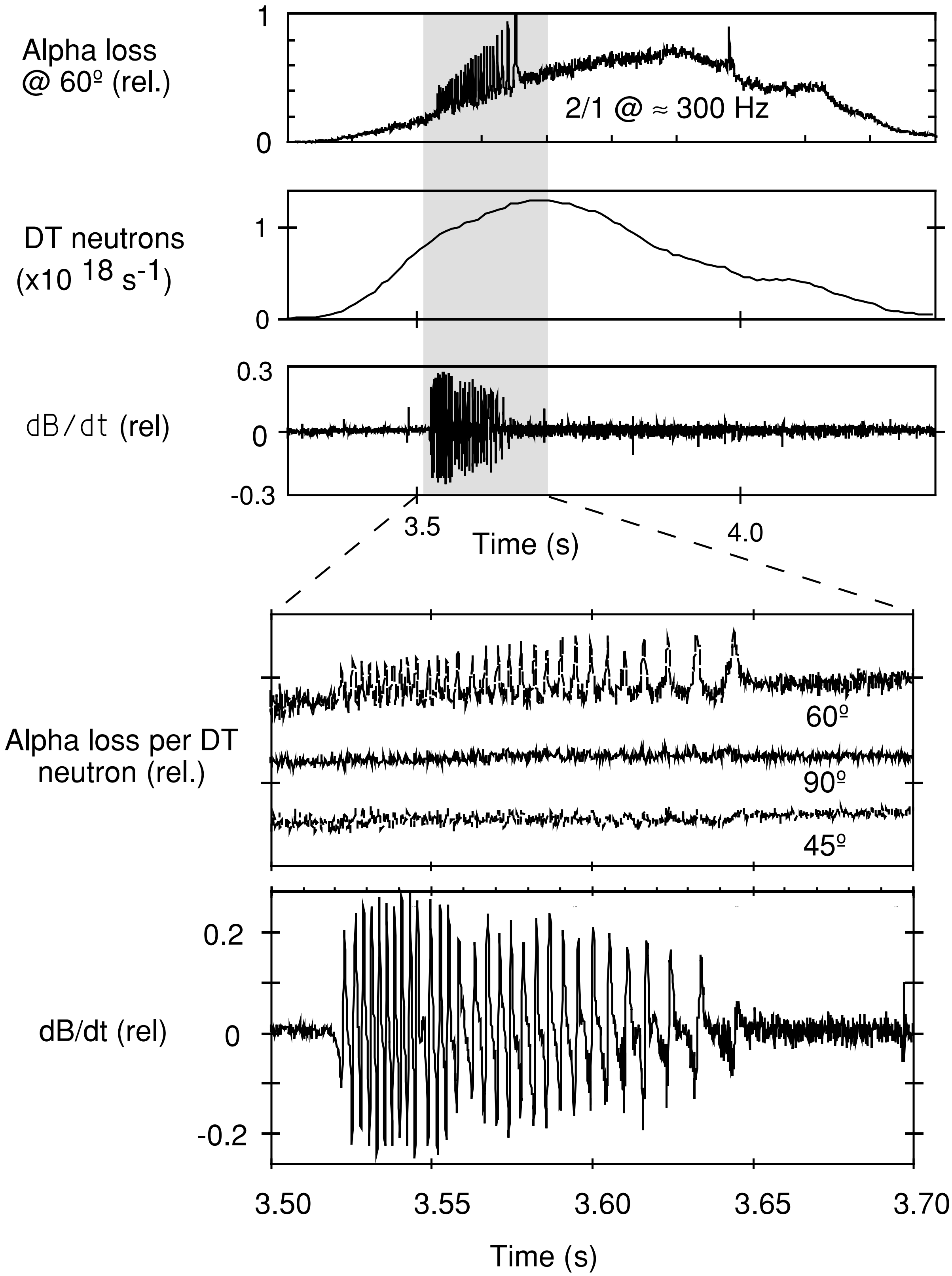
ORBIT ripple loss %
15
10
5
0
data
norm
ORBIT
ripple
loss
"collisionless" ripple loss
baseline
ramp-up
ramp-down
medium q(a)
low q(a)
medium ρ
high ρ

Fig. 11



6
4
2
0
0
1
2
3
Alpha collection fraction (×10-8)
Plasma Current (MA)
45º detector
TF ripple
loss model
norm.
First-orbit
loss model

Fig. 12



Alpha loss
@ 60º (rel.)
1
0
2/1 @ ≈ 300 Hz
DT neutrons
(x10 18 s-1)
1
0
0.3
dB/dt (rel)
0
-0.3
3.5
4.0
Time (s)
Alpha loss per DT
neutron (rel.)
60º
90º
45º
0.2
dB/dt (rel)
0
-0.2
3.50
3.55
3.60
3.65
3.70
Time (s)

Fig. 13

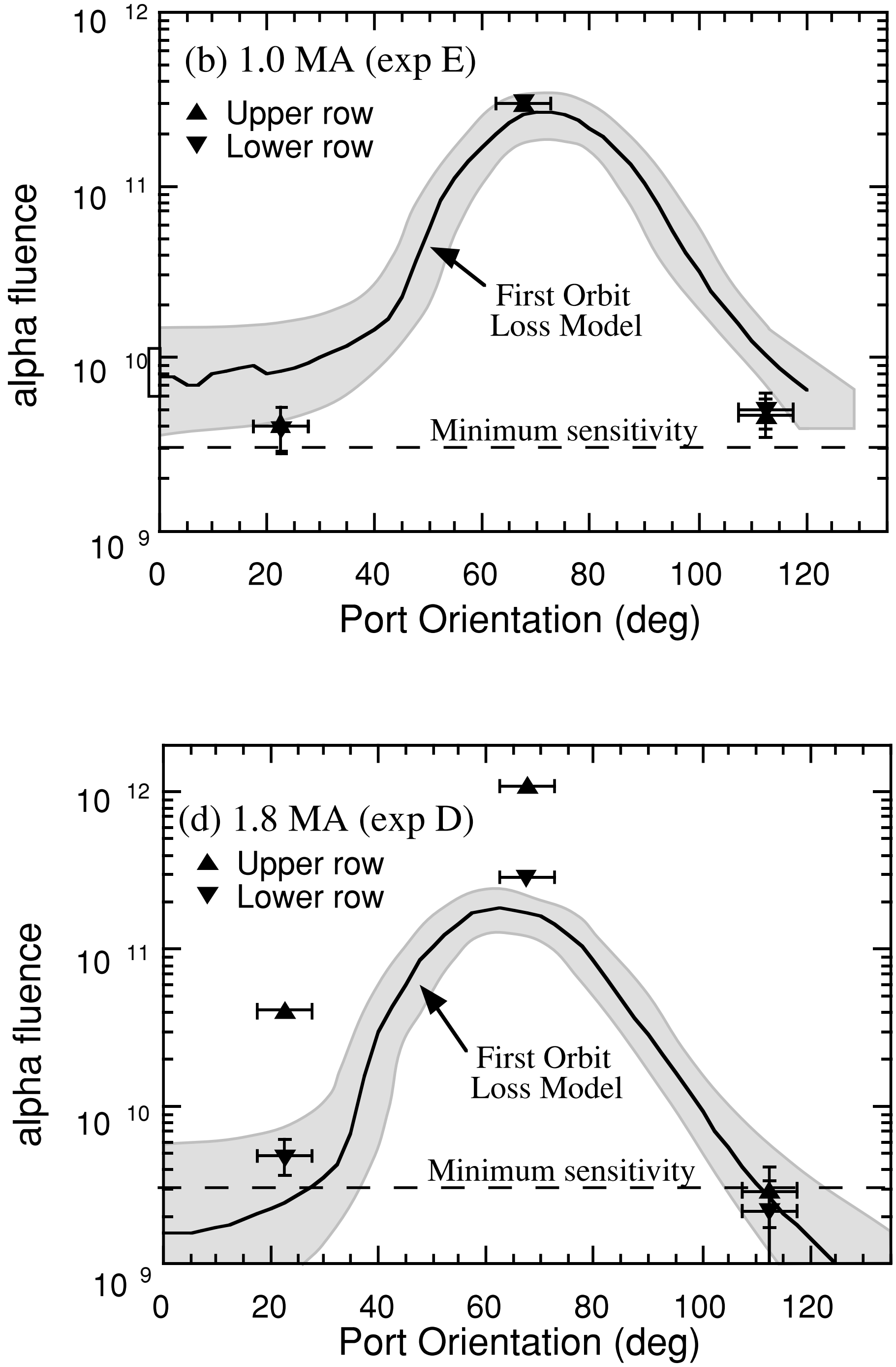

(b) 1.0 MA (exp E)
Upper row
Lower row
First Orbit Loss Model
Minimum sensitivity
alpha fluence
Port Orientation (deg)
(d) 1.8 MA (exp D)
Upper row
Lower row
First Orbit Loss Model
Minimum sensitivity
alpha fluence
Port Orientation (deg)

Fig. 14