Fokker-Planck Modeling of EBW CD

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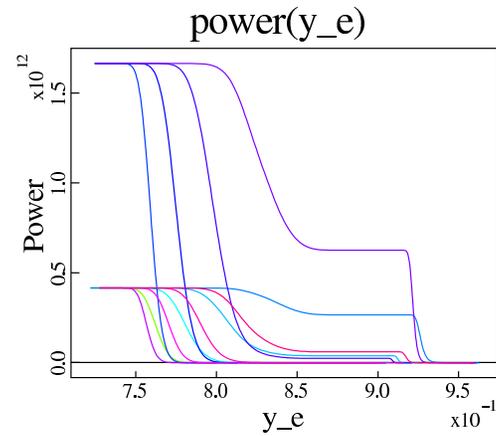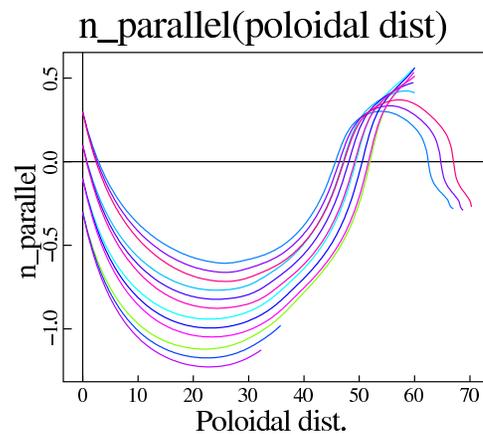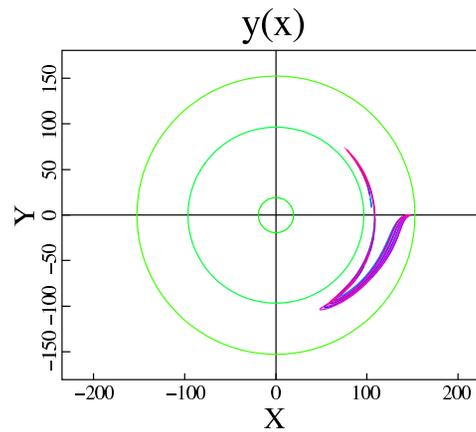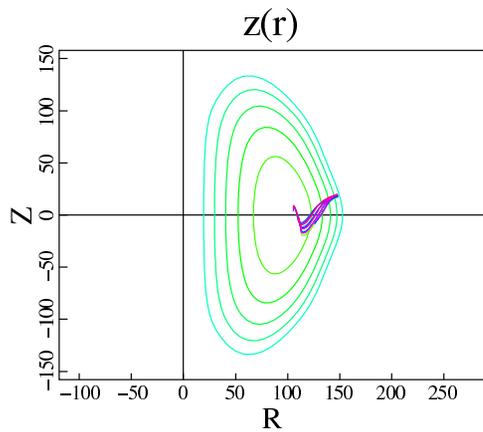
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- CQL3D/GENRAY Fokker-Planck code

- Illustrative Results

- Proposed plans

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Above Midplane Launch of EBW, with n_par=[−0.25,+0.25] over 10cm pol. length.

NSTX: n_e=6e13/cc, T_e=3 keV.
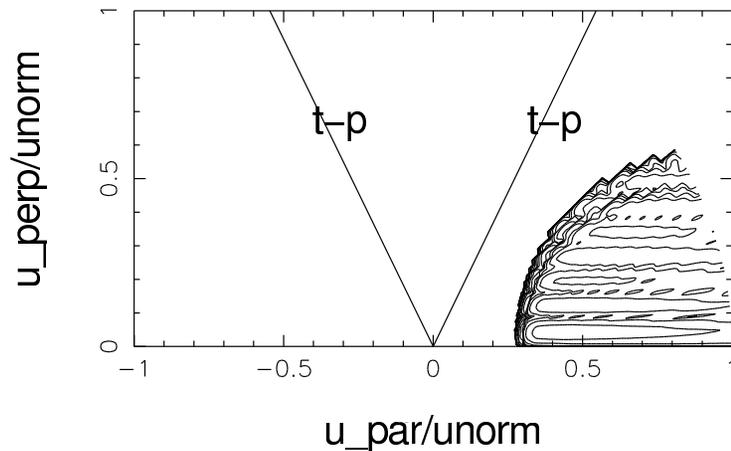
==> strong n_par downshift, penetration to cyclotron layer

CQL3D EBW QL Diffusion Coeff and Resulting Electron f_e(u,theta).

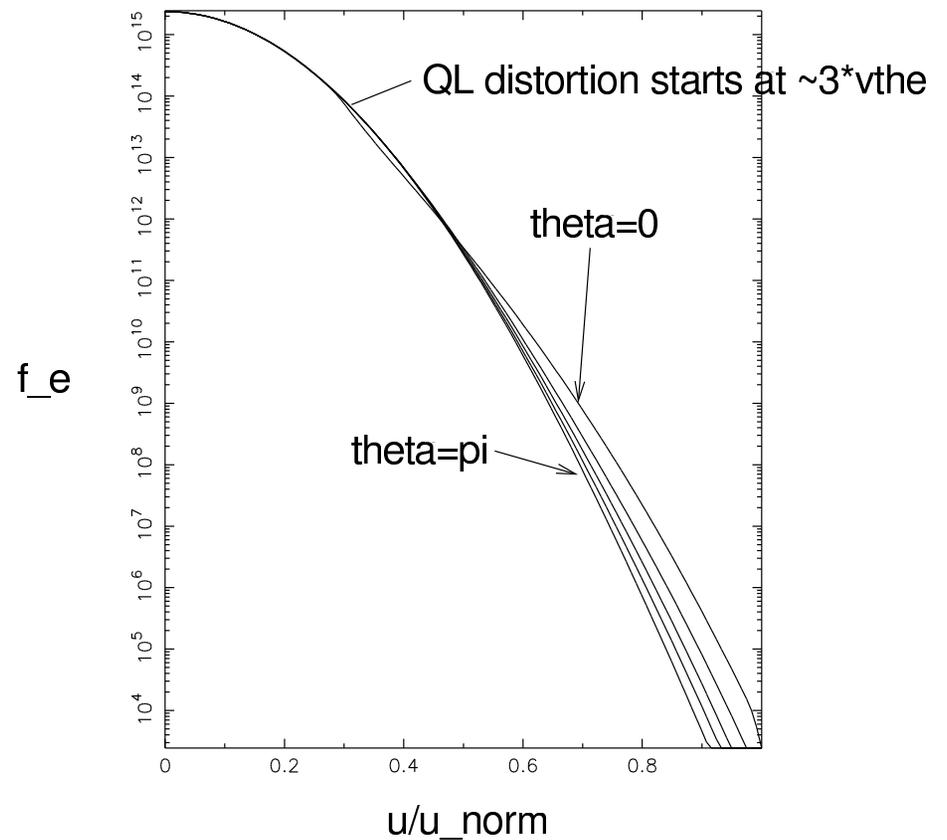## (For one of 21 flux surfaces.)

r/a=0.15
unorm such that Enorm=100 keV
vthe/unorm=0.11

QL Diffusion Coefficient

Cuts of f_e(u,theta) vs u

QL distortion starts at ~3*vthe

theta=0

theta=pi

- Bessel Functions appear important in CD efficiency. FP set up to handle this.

- FP code necessary for nonthermal CD effects, which can set in at quite low power.

- CD efficiency of order ECCD, at the moment.

Plans:

- Benchmark GENRAY against Ram code.

- Broad CD study efficiency study for NSTX.

- EBW Startup studies.

- Nonthermal EBW emission studies.

- IDL visualization tool development for dispersion.

- Radial transport effects.