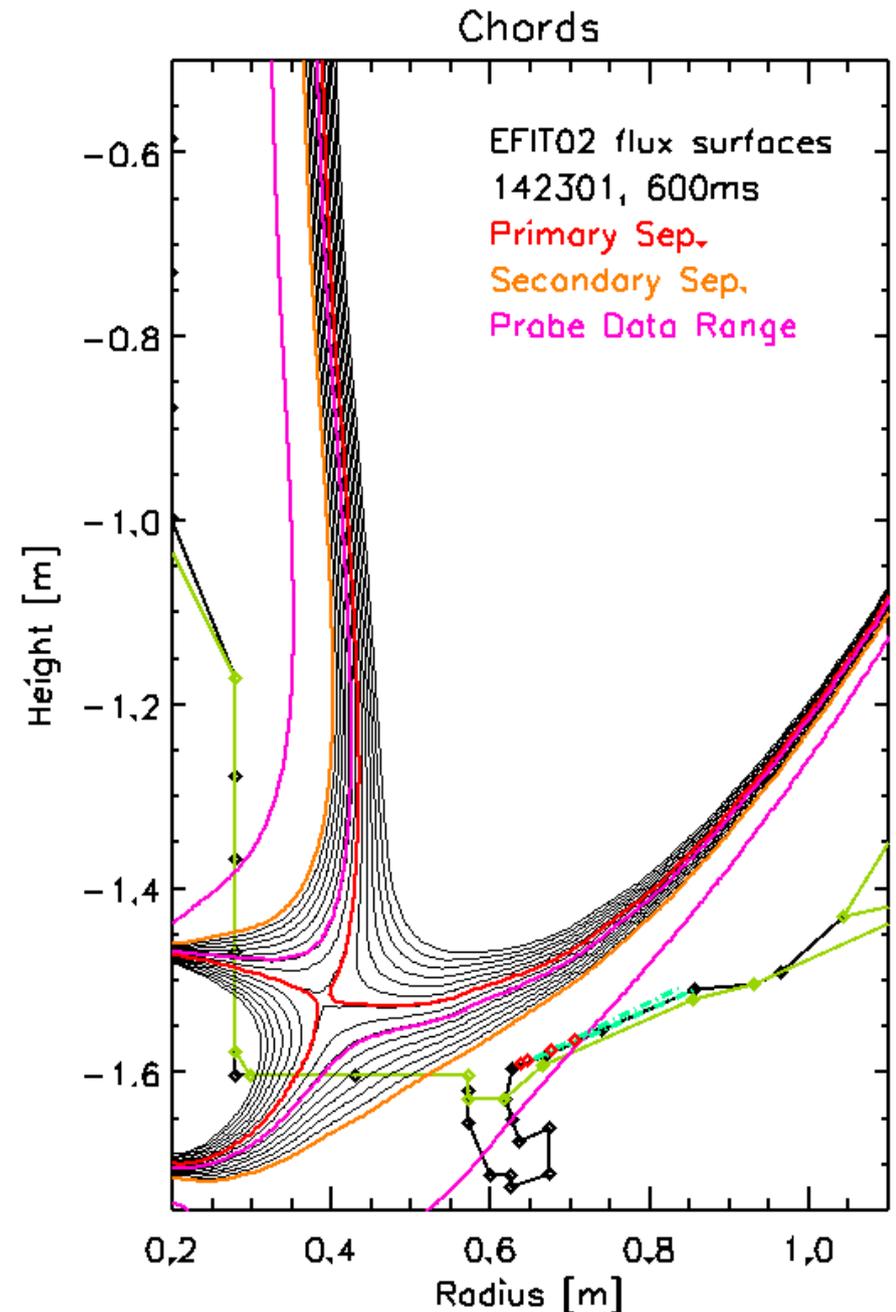


LP data related to NSTX particle exhaust for cryo-pumping calculations

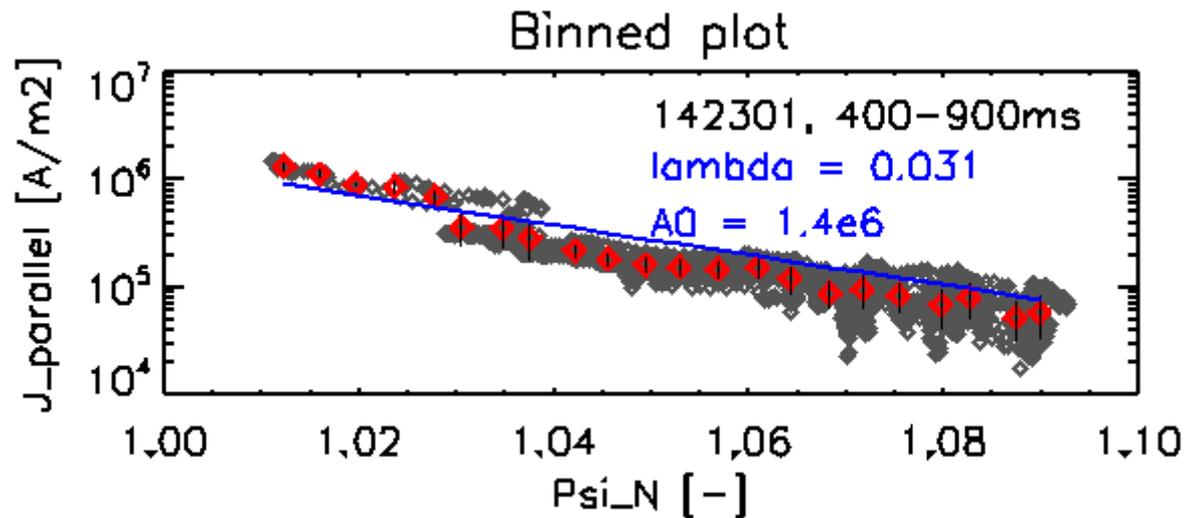
MA Jaworski
9/30/11

Most similar shot to NSTX-U: 142301

- Equilibrium for 142301 at 600ms shown at right
- Black indicate PFC limiter surfaces (including LLD)
- Light green are EFIT limiter surfaces
- Red points indicate probe locations (minus inboard probe at 0.495m)
- Primary and secondary separatrices shown in red and orange
- Natural plasma evolution results in sweep over available probes
 - Take data from 400-900ms of discharge
 - Psi_N range indicated by magenta lines for idea of physical locations, also evolves during discharge



Parallel current from available LPs



$$J_{sat, para} = \frac{I_{sat}}{A_{probe} \sin \alpha}$$

$$J_{sat, para} = A_0 \exp\left(-\frac{\psi_N - 1}{\lambda}\right)$$

Data available in following files:
 IDL save file: LP_bin_142301.sav
 CSV1: bin_combine_142301_binned.dat
 CSV2: bin_combine_142301_total.dat

- Data from all probes aggregated and binned
- Angle of incidence calculated from EFIT02 reconstruction
- Simple IV processing utilized to obtain Isat (available now)
 - There is error in this for the inboard probe data ($\psi_N < 1.035$)
 - Over-estimates the actual Isat to the PFC
- Single exponential fit applied to data (equal weighting)
 - Intercept at $\psi_N=1$ and decay length (in ψ_N units) shown on figure
- Data discontinuity coincides with Gunn probe (inboard) vs. HDLP, but also secondary separatrix ~ 1.03 in this discharge
 - Gunn probes more susceptible to low angles of attack
- FYI: density rise is simultaneous during strike-point “sweep”
 - Can look at this in more detail after APS