

Thomson Scattering on NSTX

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NSTX Five-Year Plan Ideas Forum

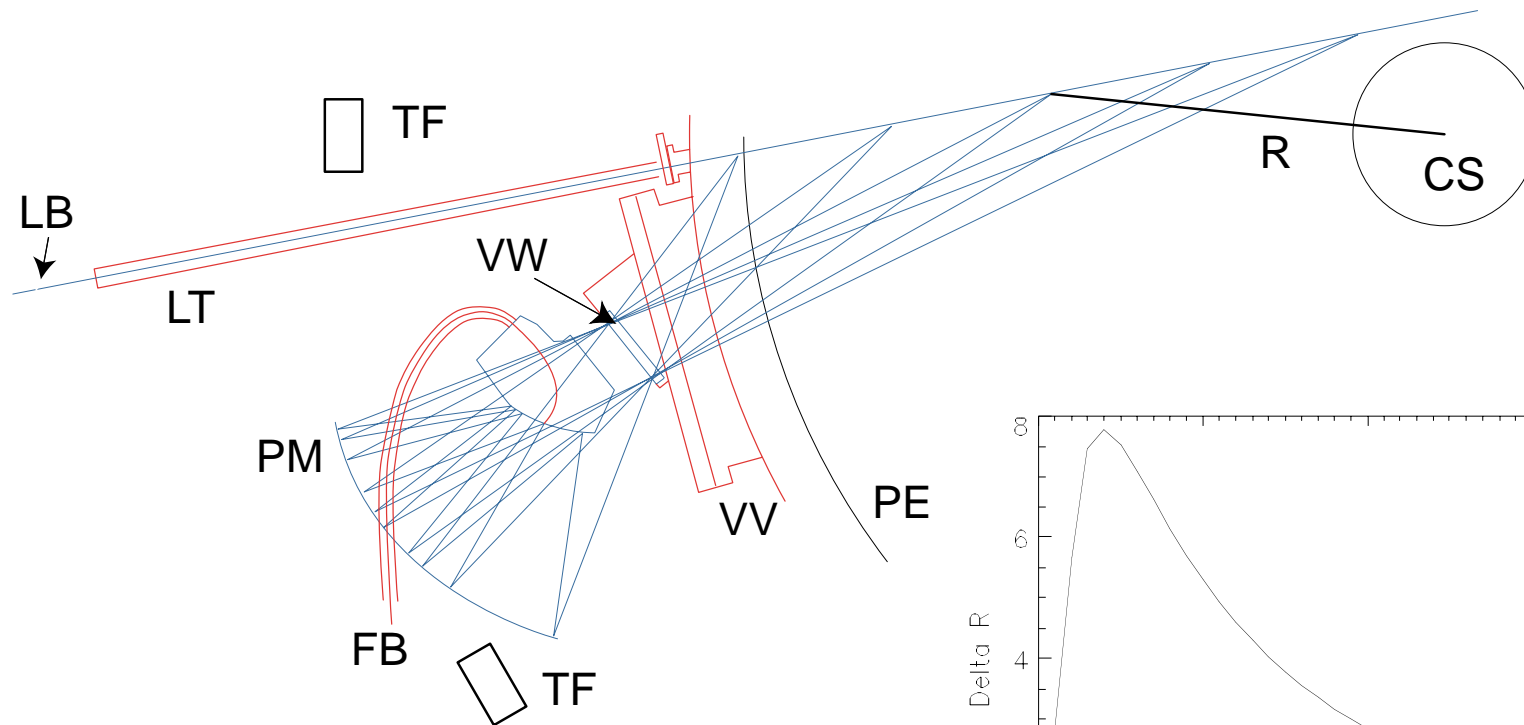
25 June 2002

Princeton, NJ

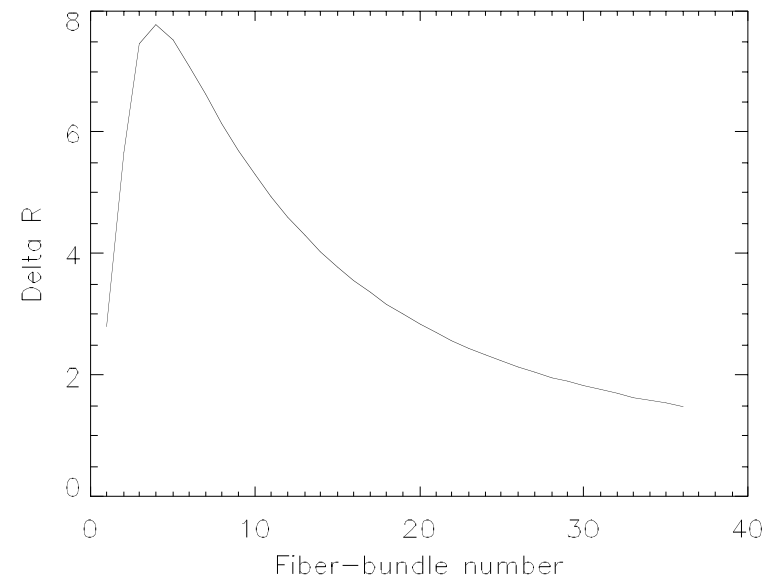
Present Configuration Design Specification

- Presently have 20 spatial channels at 60 Hz.
 - Two 30-Hz YAG lasers.
 - $\Delta T = 0.4\text{-}16.7$ ms.
 - $\Delta R \geq 1.7$ cm.
- Nominal design: 36 spatial channels at 90 Hz.
- System designed for highest spatial resolution at outer edge.
 - Extra spatial channels can be added for better resolution.

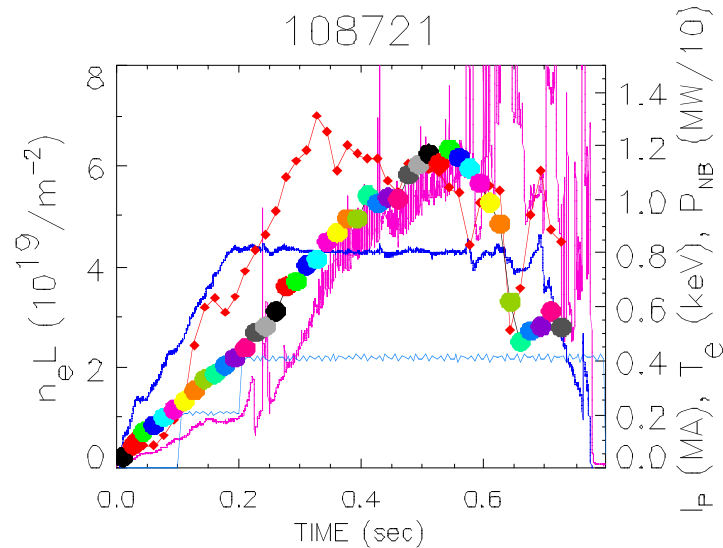
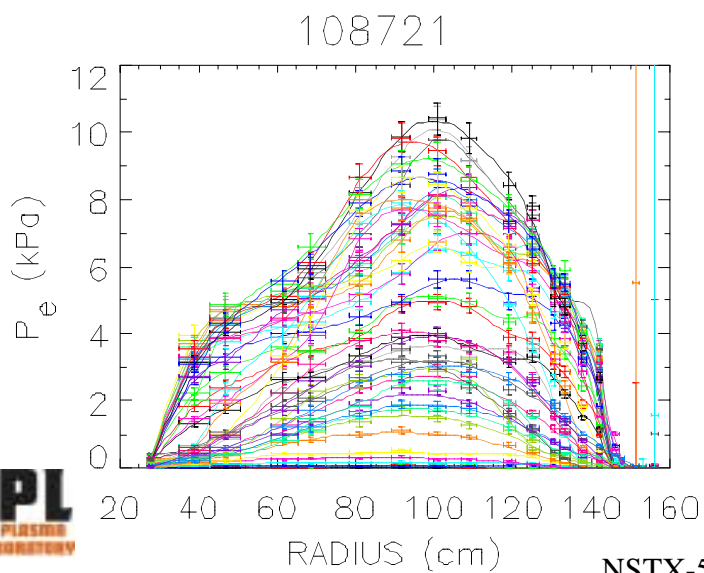
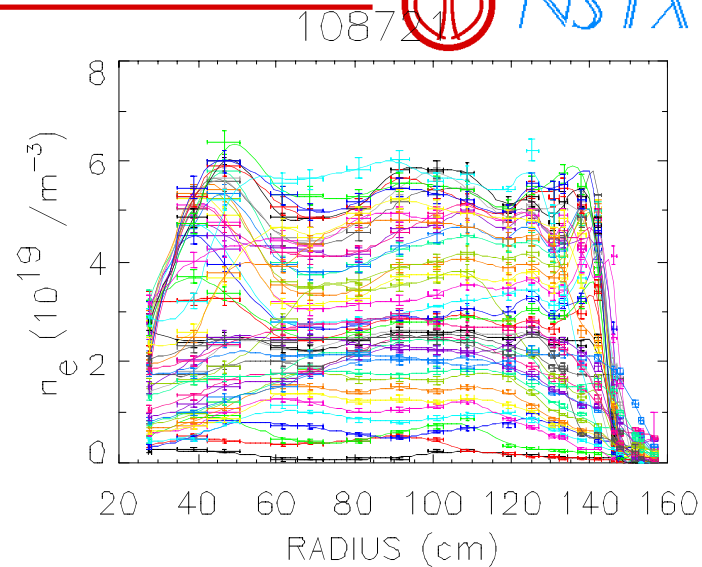
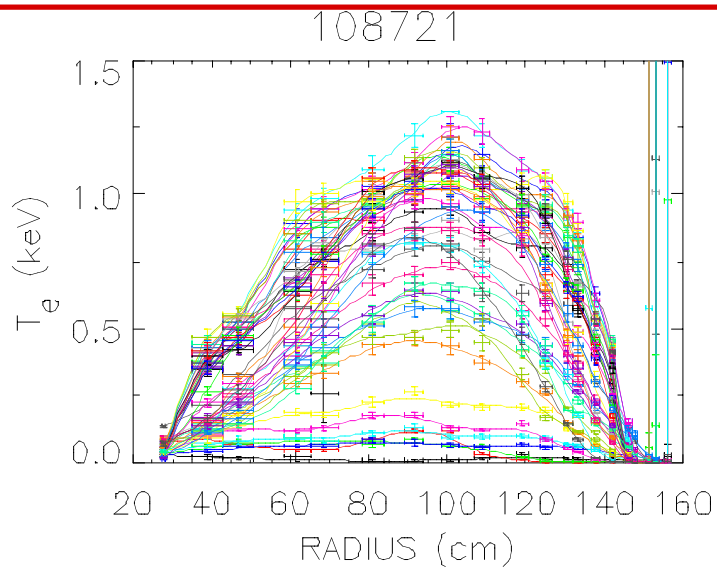
MPTS Collecting Optics



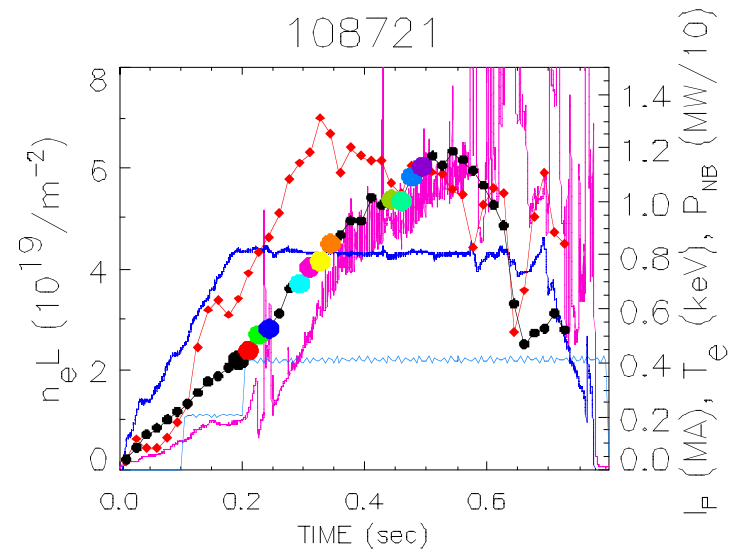
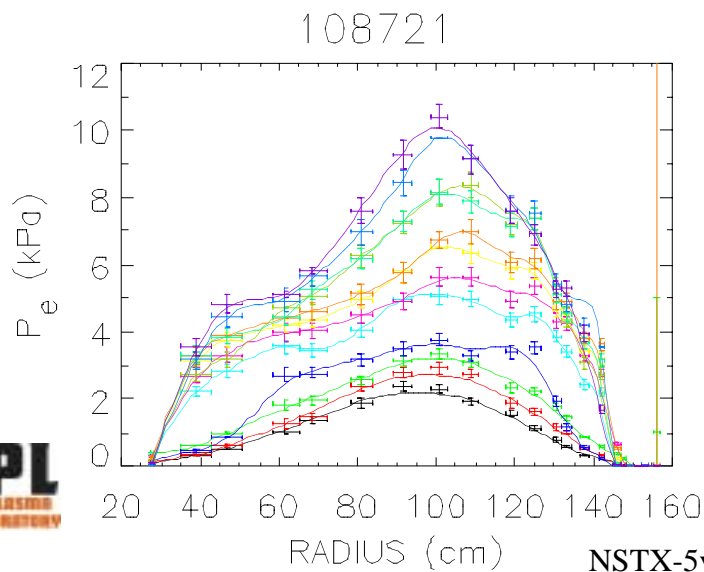
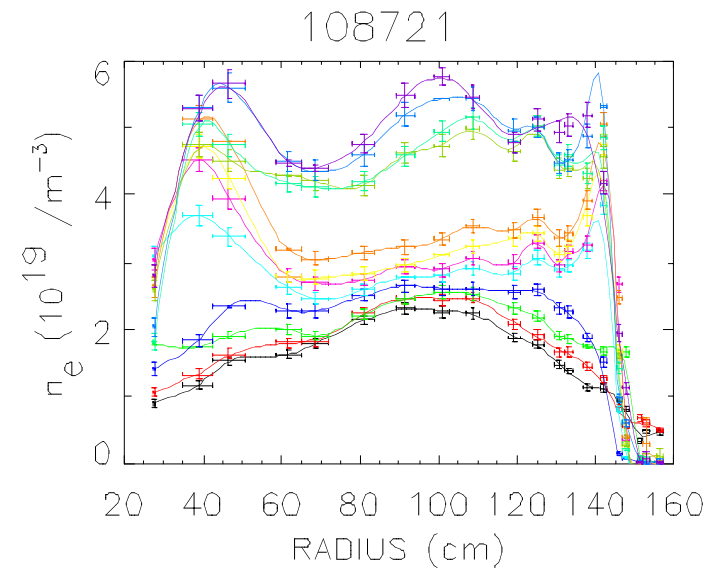
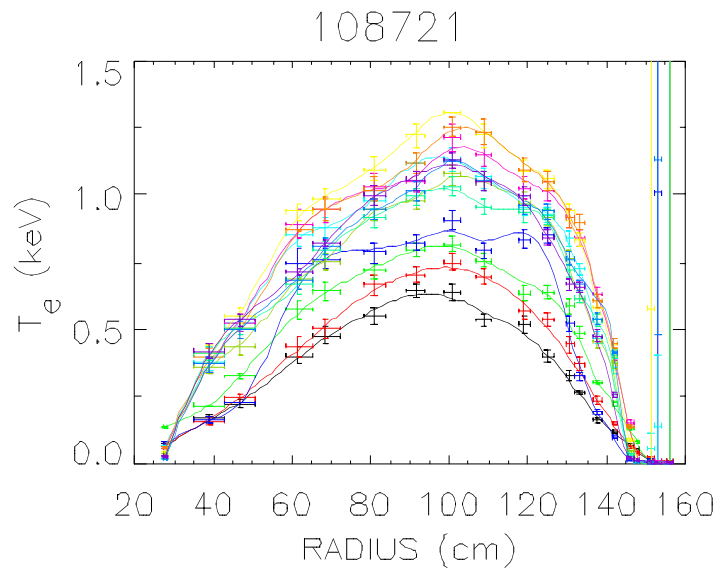
- 36 fiber bundles.
- 20 fiber bundles instrumented.
- Some bundles “see” the SOL.



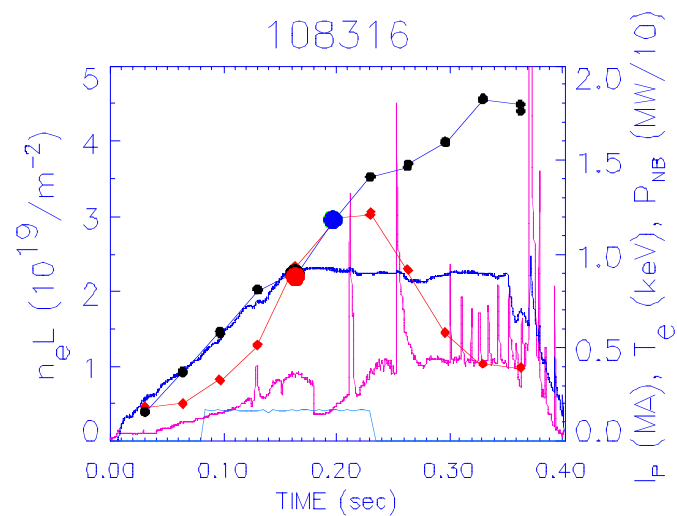
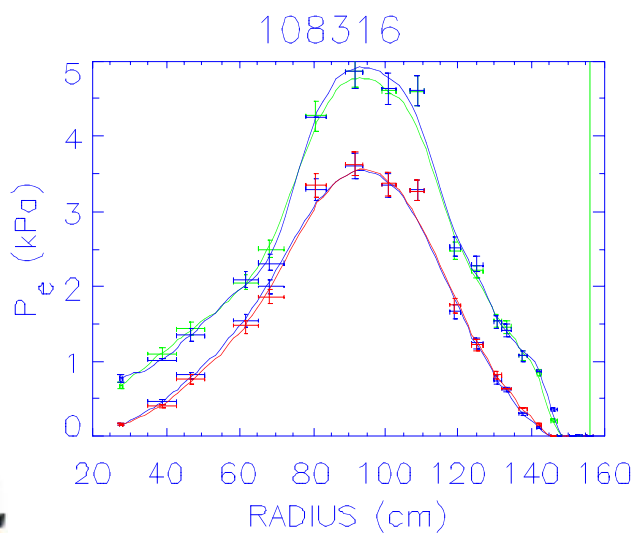
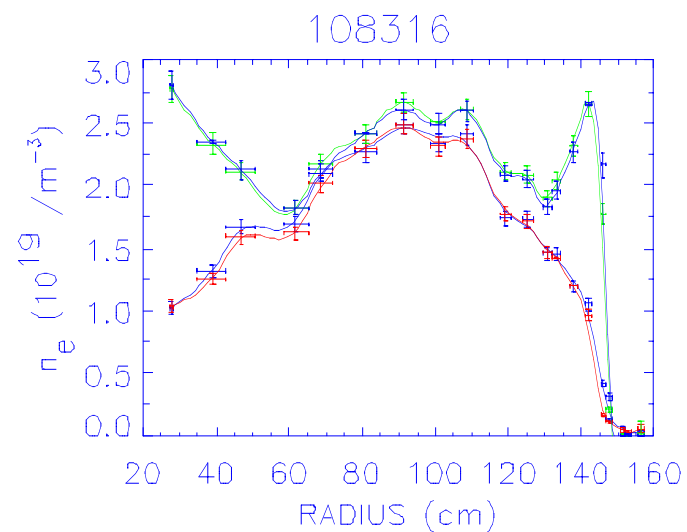
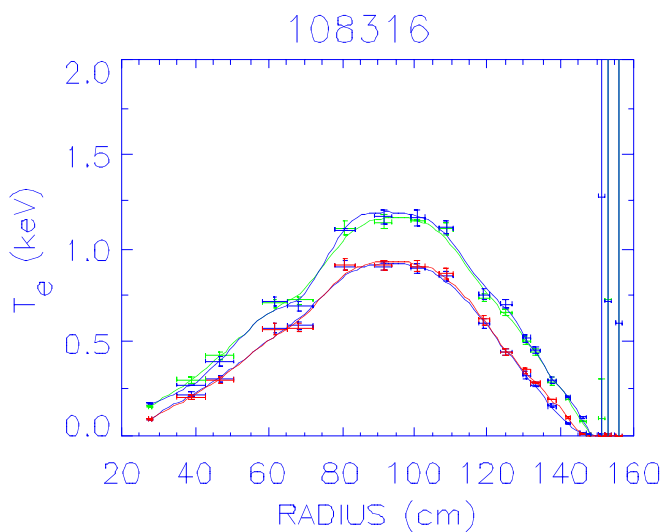
MPTS: 20-channel Output



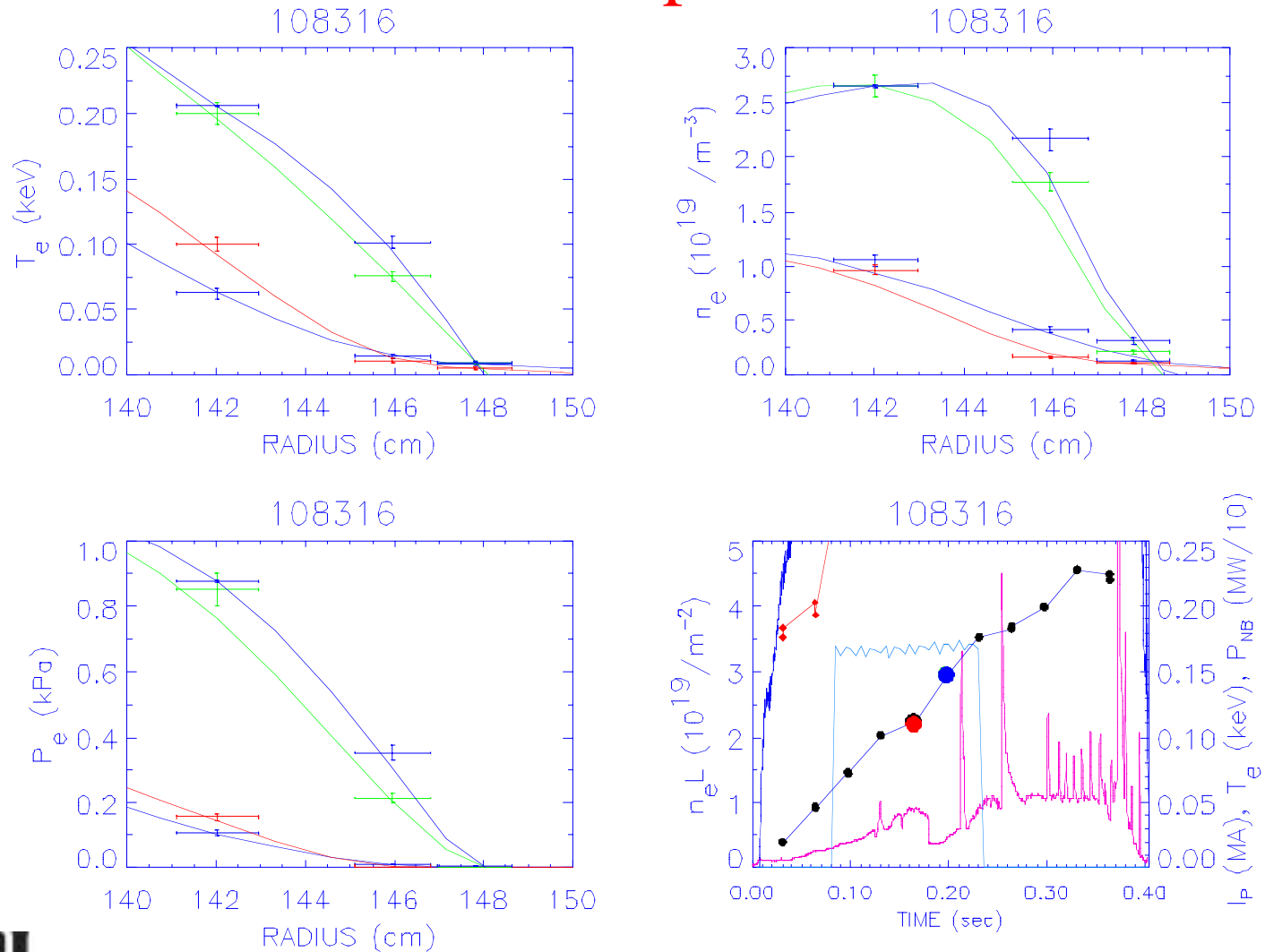
Same Data with Selected Time Points



$\Delta T = 0.4$ ms



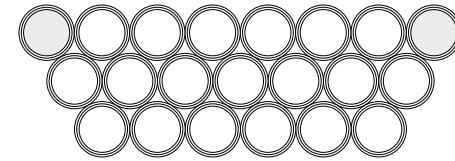
Spatial Resolution at Outer Edge Can be Improved



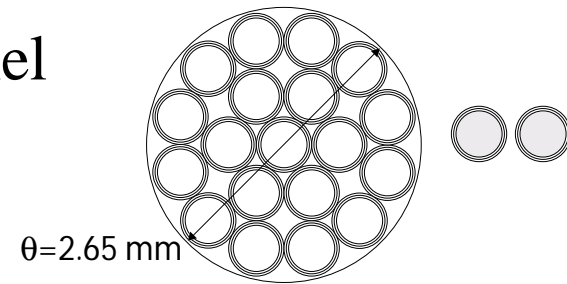
More Spatial Channels

- 16 fiber bundles still not instrumented.
- Individual fiber bundles can be divided at output end for added spatial resolution.
- Potential 40-45 spatial channels.

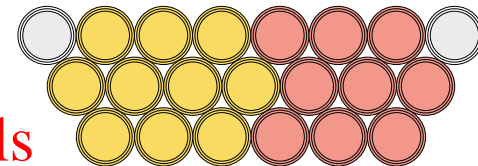
1 bundle



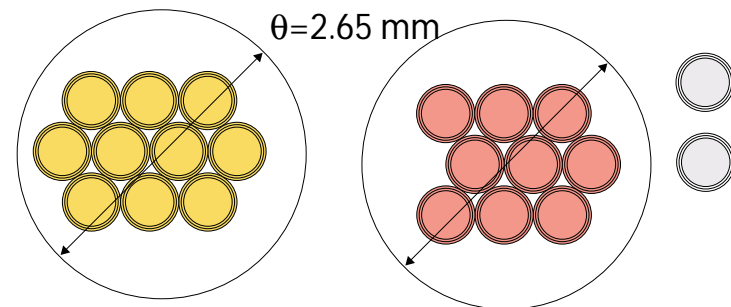
1 channel



1 bundle



2 channels



Fast Data $T_e(R,t)$ and $n_e(R,T)$ Delivery



- Presently multiplexed signals sent to CAMAC digitizers.
 - Delivery times 2-6 minutes.
- In future, send multiplexed signals to PCI-based digitizers.
 - Data sent directly to live memory for computation.
 - Delivery time aimed of a few ms.

New Center Stack Issues

- Wider center stack likely to block existing laser beam path.
- Re-aiming of lasers.
- Modification of the collecting optics.
- Could be a substantial project.

