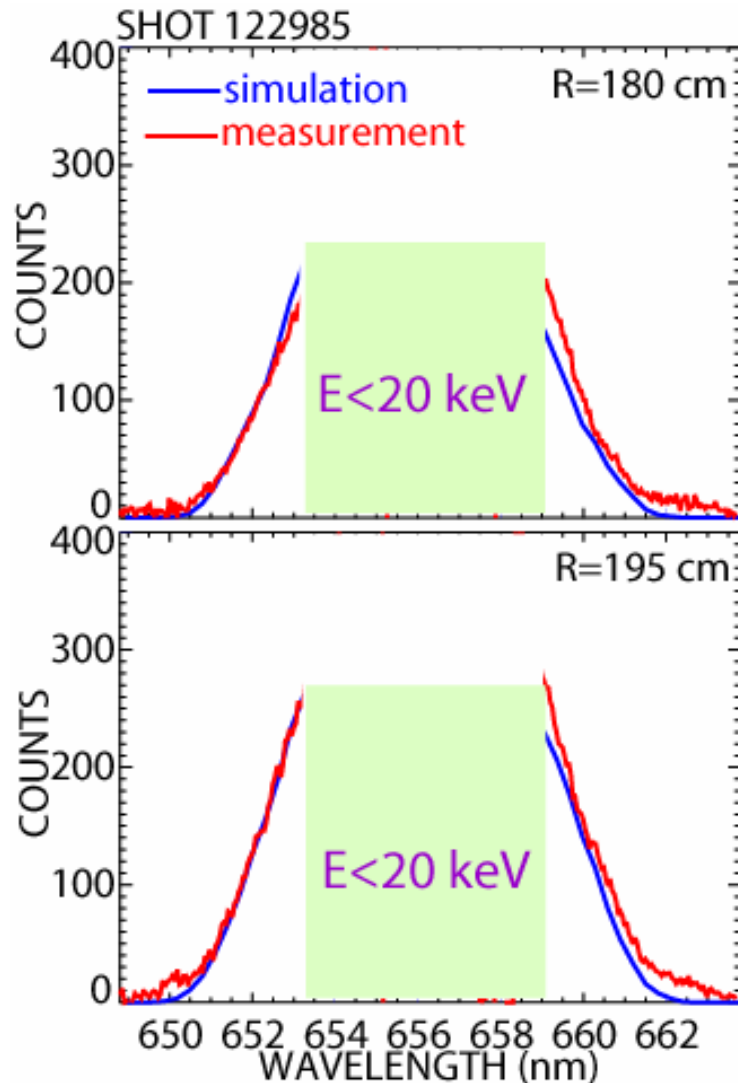


Quiet plasmas to validate fast-ion diagnostics

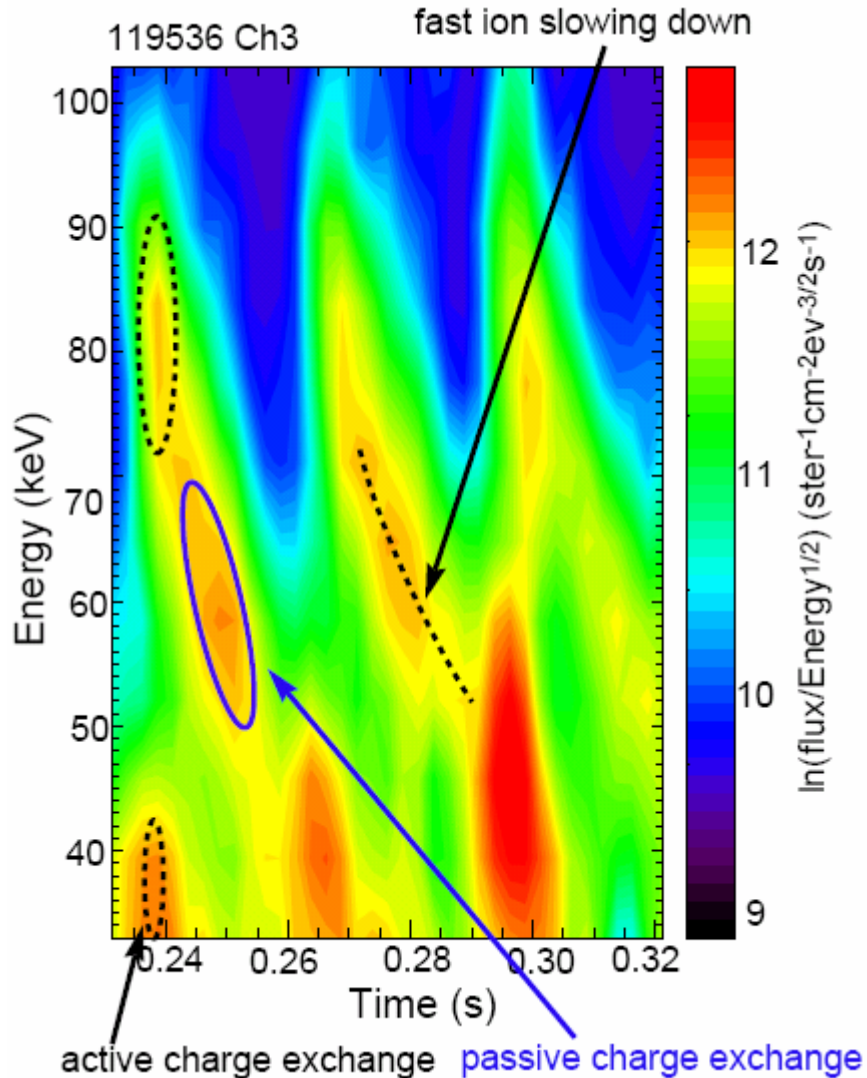
DIII-D Data



- Comparisons of FIDA data with classical predictions validated the DIII-D diagnostic
- The NSTX FIDA diagnostic has important differences → need similar validation experiments
- Also need to understand the relative contributions of injected, halo, and edge neutrals to SSNPA & NPA diagnostics for spatial transport measurements
- Suitable quiet shots are rare → need dedicated time

Use beam modulation to avoid instabilities and deconvolve signals

NSTX SSNPA data during beam blips



Liu, (2007) APS.

- Comparing FIDA beam modulation signals with offset views \rightarrow check background subtraction
- Accurate measurements of active & passive contributions to SSNPA & NPA signals \rightarrow check modeling.
- Halo neutrals an order of magnitude smaller in helium \rightarrow check spatial localization

Essential preparation for MDC-11:
fast-ion transport by instabilities

(also Liu's Ph.D. thesis)

Quiet plasmas to validate fast-ion diagnostics

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Waves & Energetic Particles

- Helium then deuterium target plasmas
- Various modulation timings
- All three sources at several voltages

0.5-1 runday

3 Sources

Essential: All fast ions, Thomson