NSTX's First Plasmas as Seen by the Kodak Fast Framing Camera

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with the help of

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Movie clip previews for all shots at:

http://wsx.lanl.gov/nstx.html

Click on the  signs to view the clips.

If you need a viewer for MPEG clips please follow the link:

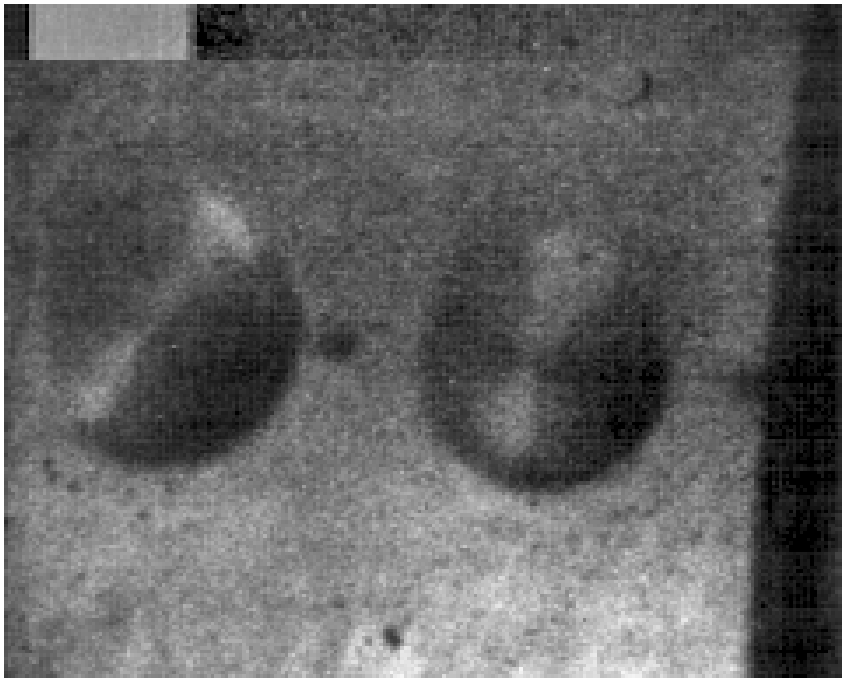
http://www-dsed.llnl.gov/documents/WWWtest.html

Fast Camera Setup

Framing speed: 1000 fps

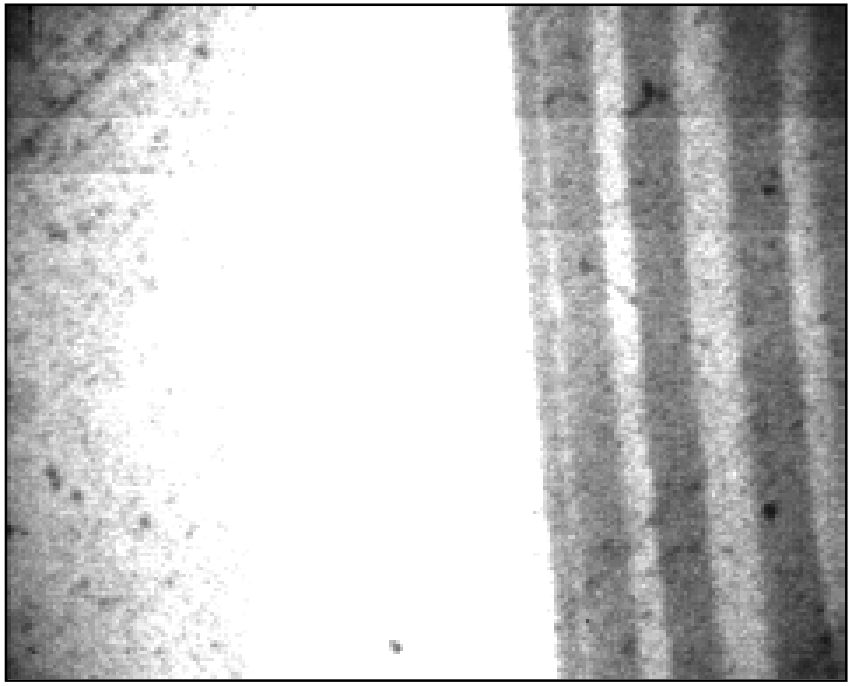
Frame exposure: 10 μs to 1 ms

Filter used: none or Dα

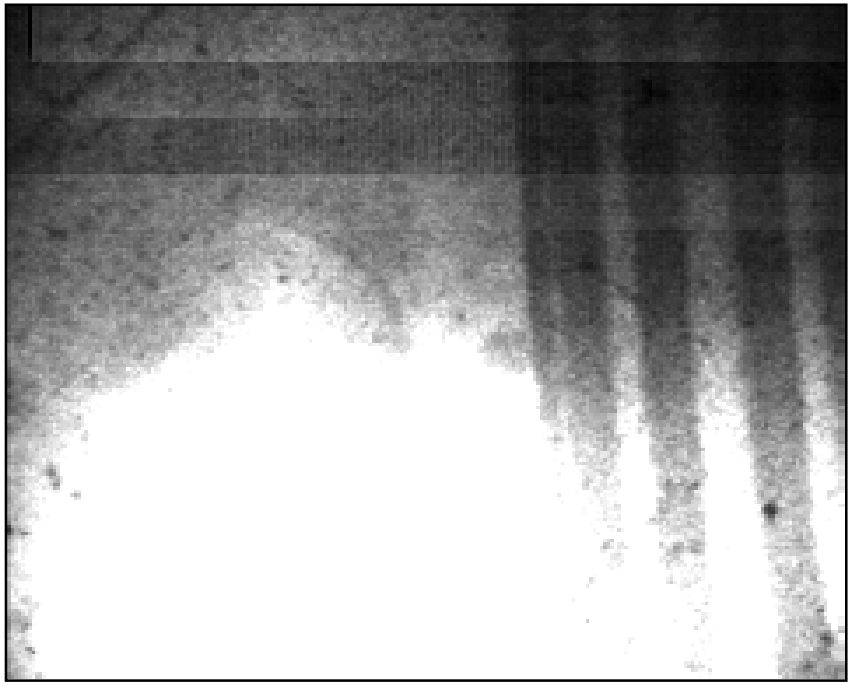


Shot 100183 at 73 ms

The Kindergarten Plasmas



21 ms

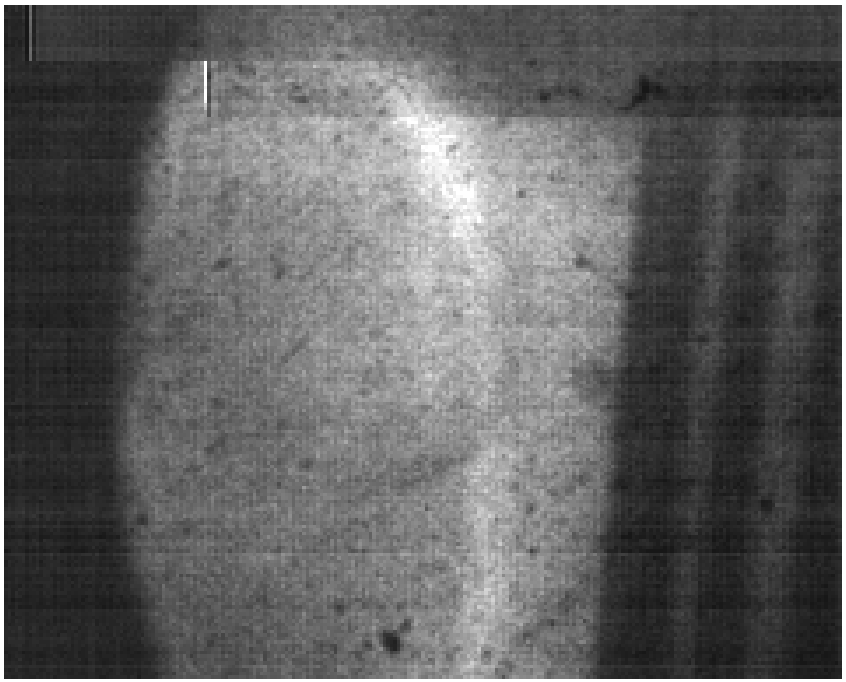


33 ms

Shot 100136

Plasma Startup

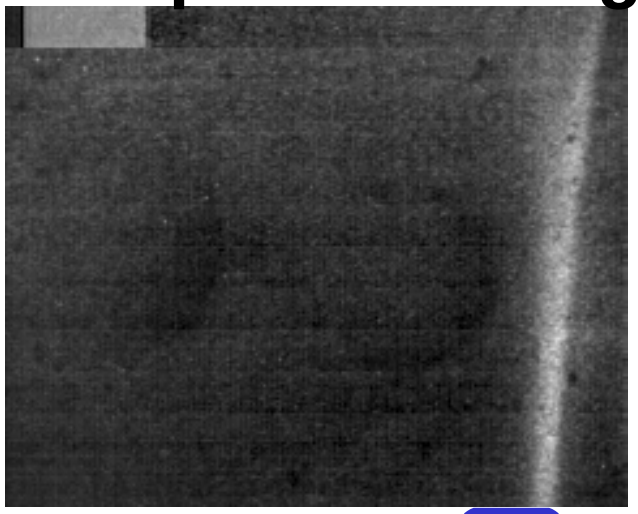
First light generally seen at approx. 13 ms
which localizes in an interior edge soon after



Shot 100151 at 16 ms

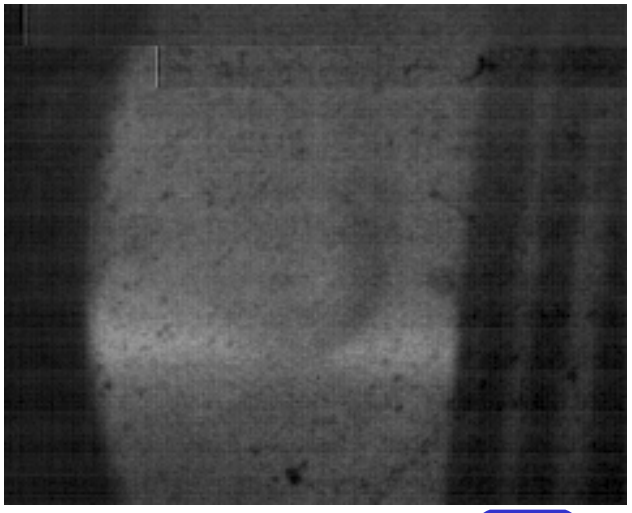
The Developed Discharge

Quiescent phase

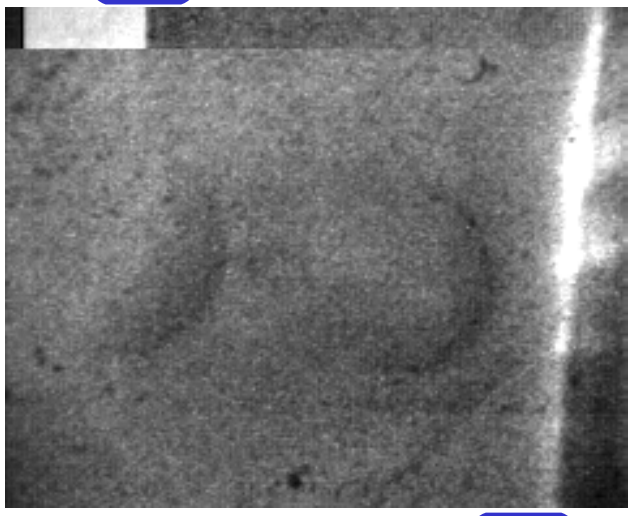


Shot 100181 at 57 ms

Increased limiter or center stack contact



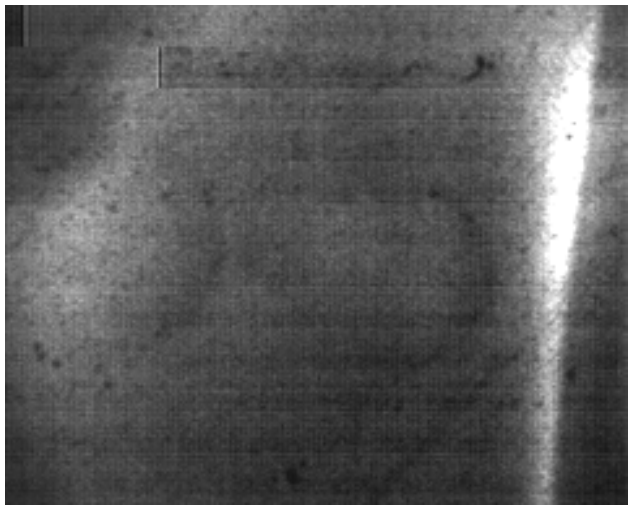
Shot 100159 at 31 ms



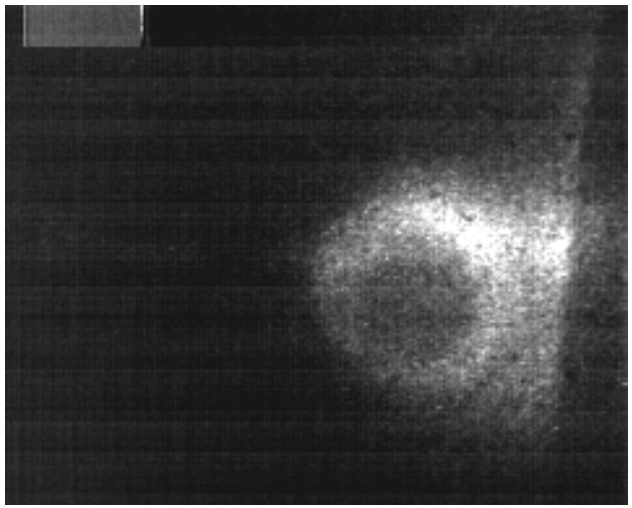
Shot 100173 at 69 ms

Discharge Termination

Exterior edge moves inward

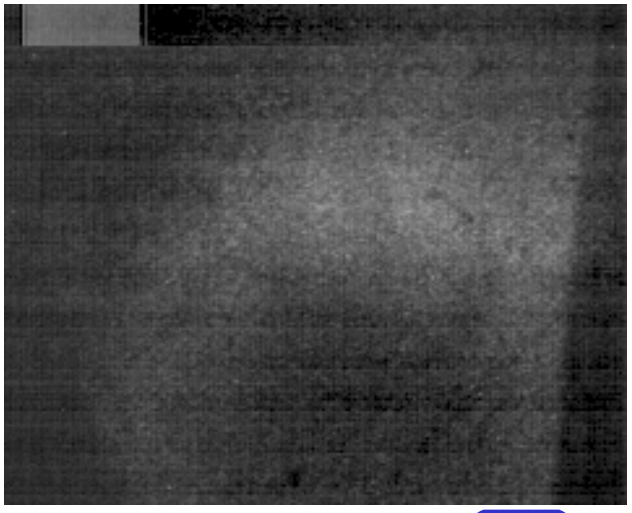


Shot 100164 at 47 ms



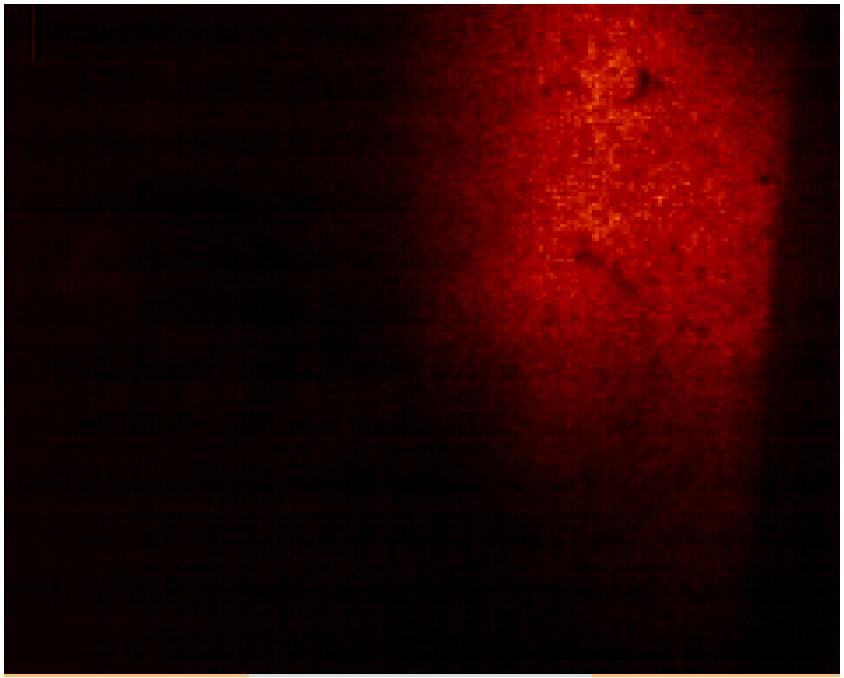
Shot 100174 at 80 ms

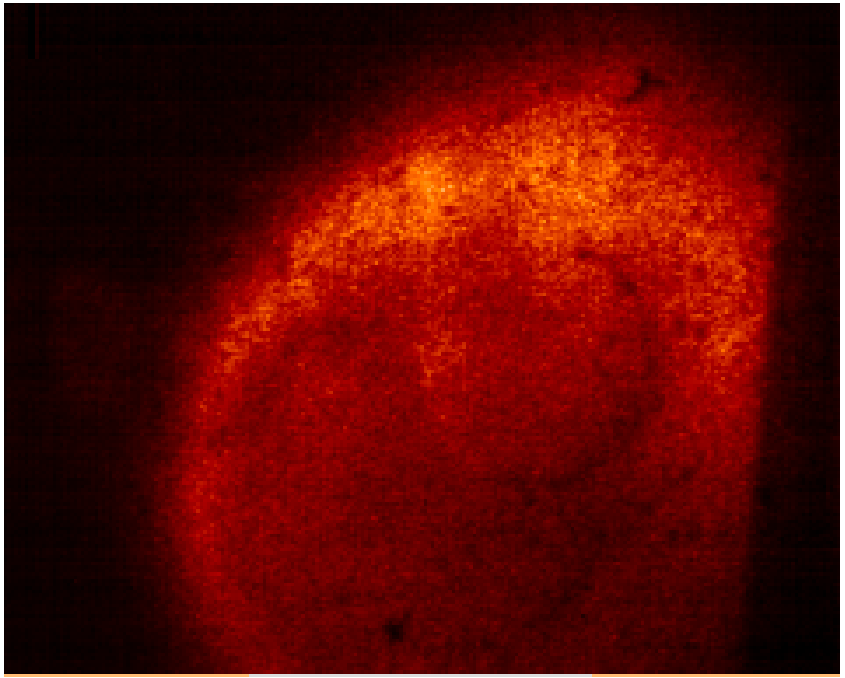
Plasma shifts downward



Shot 100195 at 129 ms

Discharge Observed in D_α light





15 ms

31 ms

Shot 100233

Fast Camera Data Access

- Preview MPEG clips can be seen on the web at:
  http://wsx.lanl.gov/nstx.html
  In addition, both PPPL and LANL have copies of the VCR tape made during the run.
- All downloaded "raw data" (TIF files) have been copied in CDs, also available at both PPPL and LANL. We can also make the TIF files available via anonymous FTP. Please contact wurden@lanl.gov or maqueda@lanl.gov.
- The camera settings for each shot are available at the PPPL DEC cluster and are part of the MDS+ tree.

Conclusions and Final Remarks

- The plasma responded as expected to the "human" feedback facilitated by the Kodak fast camera.
- The Kodak fast camera will be part of NSTX as the experiment enters "college" and acquires the tools needed for real life: feedback control, full OH swing, some auxiliary heating, CHI, etc.
- As the experiment evolves we plan to progressively shift the camera use away from operations and into physics. We plan to study: edge turbulence, plasma-wall interactions, divertor and CHI issues, and perhaps, IRE/disruption events.
- We have proposed to buy a new fast framing digital camera that runs at up to 40000 frames per second. In which case we could use the new camera for physics studies and the current one to assist operations.