

# Fast visible imaging of edge plasmas for wall condition studies

R. Maqueda, and the NSTX edge group

## Motivation:

Wall conditions (for example, boronized walls), and by extent plasma-surface interactions, are a known but yet not well understood variable for accessing improved confinement regimes.

## Proposal:

Use a fast-framing ( $\geq 1$  kHz), visible, intensified digital camera to quantify and study the surface conditions and plasma interactions that lead, or not, to improved confinement.

## Hardware upgrades:

- Remote controlled filter wheel for Kodak camera.
- Upgrade coherent fiber bundle.
- Develop zoom/steering remote-controlled optics.



# Infrared imaging of plasma facing surfaces, heat load reduction development

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- **Desired measurements**
  - Heat loads on plasma facing components including the divertor surfaces and limiters.
  - Localization of hot spots, possible sources of impurities.
  - Heat loads due to ELMs and IREs.
  - Access fast particle loss physics.
- **Hardware**
  - Use video camera sensitive in the mid IR range: 3-5  $\mu\text{m}$ , with  $> 1$  kHz resolution.
  - Use IR periscopes based in ZnSe optics to transport the image to the IR camera.
- **Heat load reduction development**  
**Important for extended pulses at high heating power.**
  - Divertor detachment - radiative divertor.
  - Radiative mantles.
  - Strike point sweeping.