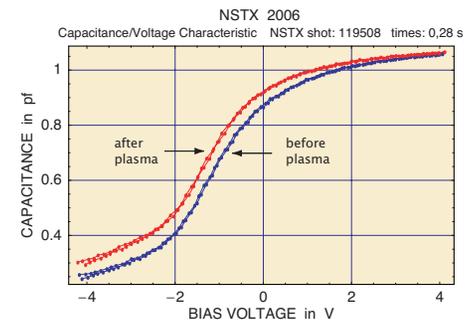
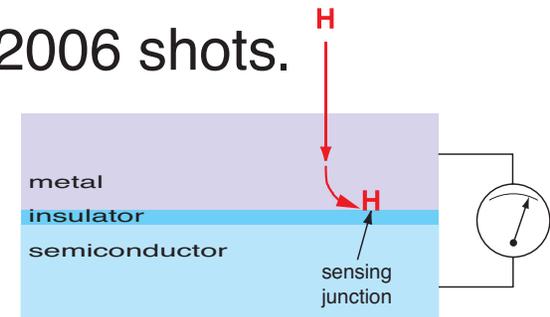
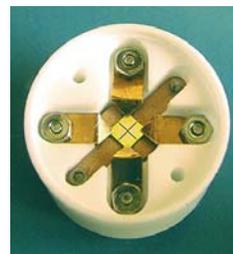
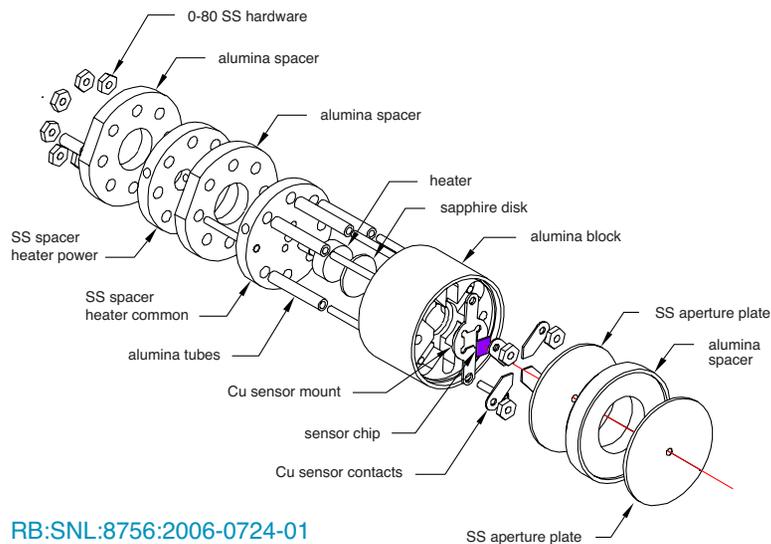


Hydrogen sensor diagnostic development

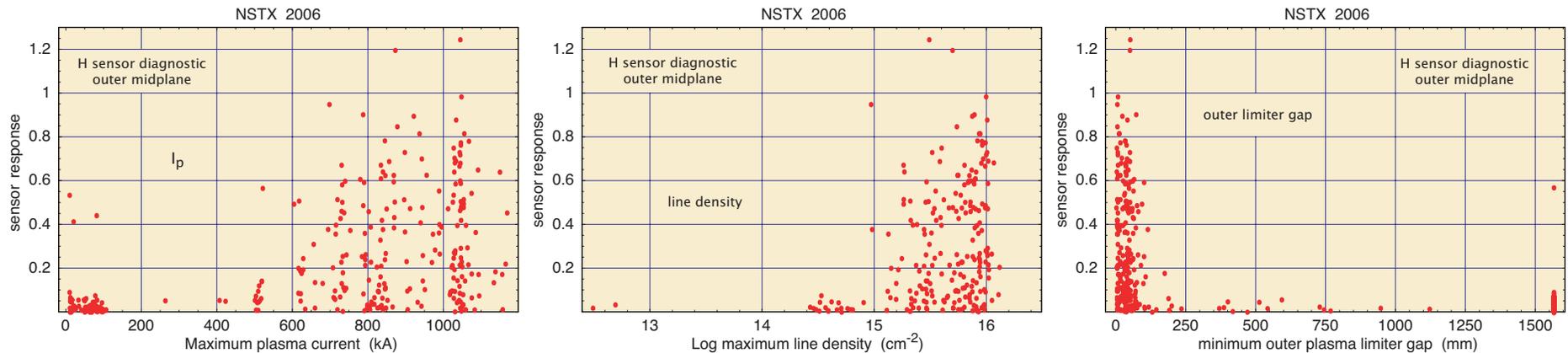
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- A compact diagnostic to monitor energetic neutral hydrogen striking the outer midplane wall of NSTX was tested in 2006.
- The diagnostic uses a solid-state hydrogen sensor, which consists of a Pd film capacitor whose flat band voltage changes when hydrogen is implanted into the device.
- Integrated data were recorded on most 2006 shots.



Hydrogen sensor diagnostic - results



- Shot-by-shot sensor response correlated with plasma current, line density, and outer limiter gap.
- Observed unusual effects of plasma exposure on CV curves, perhaps due to particle and radiation (X-ray) damage in the insulator layer (SiO_2). This prevented calibration using lab data to relate sensor response to incident H flux.
- Further development of sensor is planned to improve damage resistance, add energy discrimination, and possibly time resolution. Future use in a poloidal array is being considered.