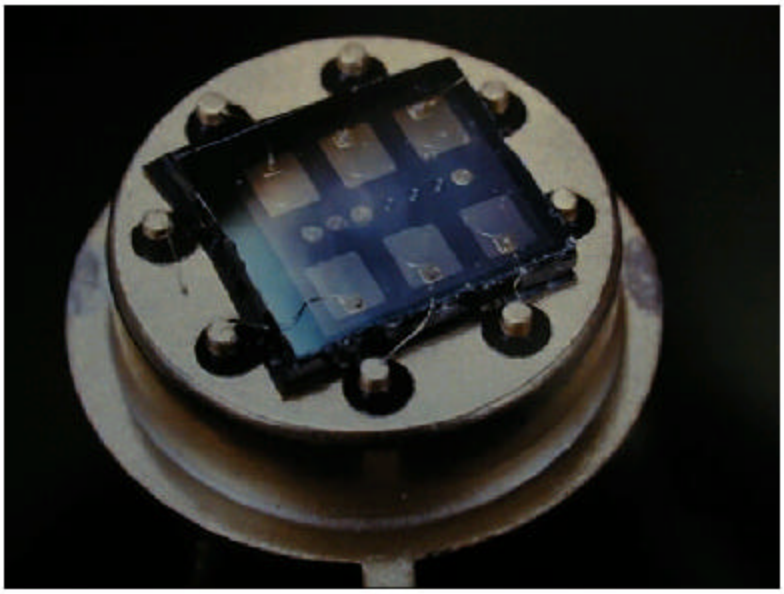
Hydrogen microsensors



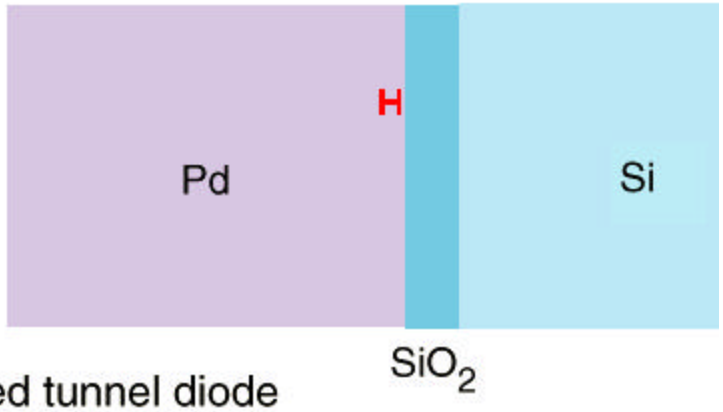
- Sandia has deve
  solid-state micro
  that can monitor
  escaping from p
- Hydrogen micro
  are small, robus
  devices, which h
  response and hi

6 element H spectrometer on a chip

- The project has combined surface physics an
  electronics to produce a compact new diagnc

Hydrogen microsensors: theory of operation

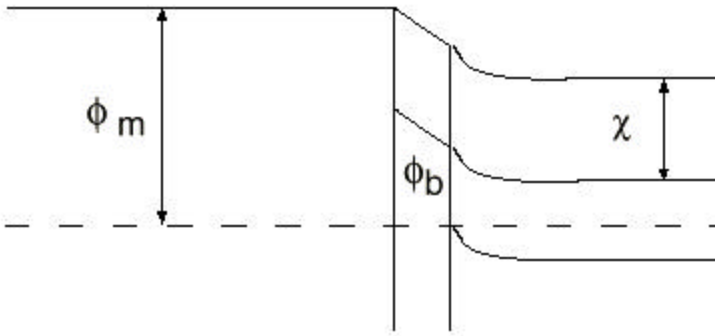
- Implanted hydrogen
  1 - filters quickly through metal
  2 - traps near interface
  3 - alters barrier height
  4 - affects electron flow across junction.



- Example: a reverse-biased tunnel diode

$$\phi_b \doteq \phi_m - \chi$$

$$I_r = A\, e^{-\phi_b/kT}$$



small barrier height change ⇒ large device response

Hydrogen microsensors: an advanced diagnostic for fusion plas

- Hydrogen microsensor features:
  - simple, reliable, and compact
  - compatibile with tritium, neutrons, an
  - remotely controlled and maintained.
- Hydrogen microsensor fusion applications:
  - monitor the particle flux to the first wa
  - measure the energy of impinging par
  - determine spatial and directional ani