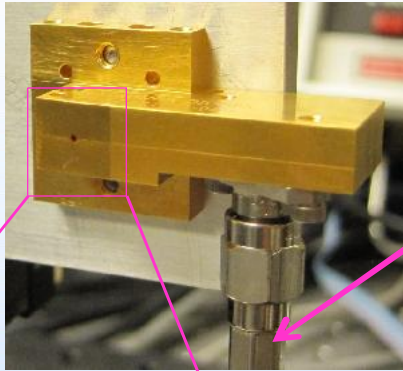


# VDI WR-0.4 (1.8-2.8 THz) Mixer

WR-0.4FM



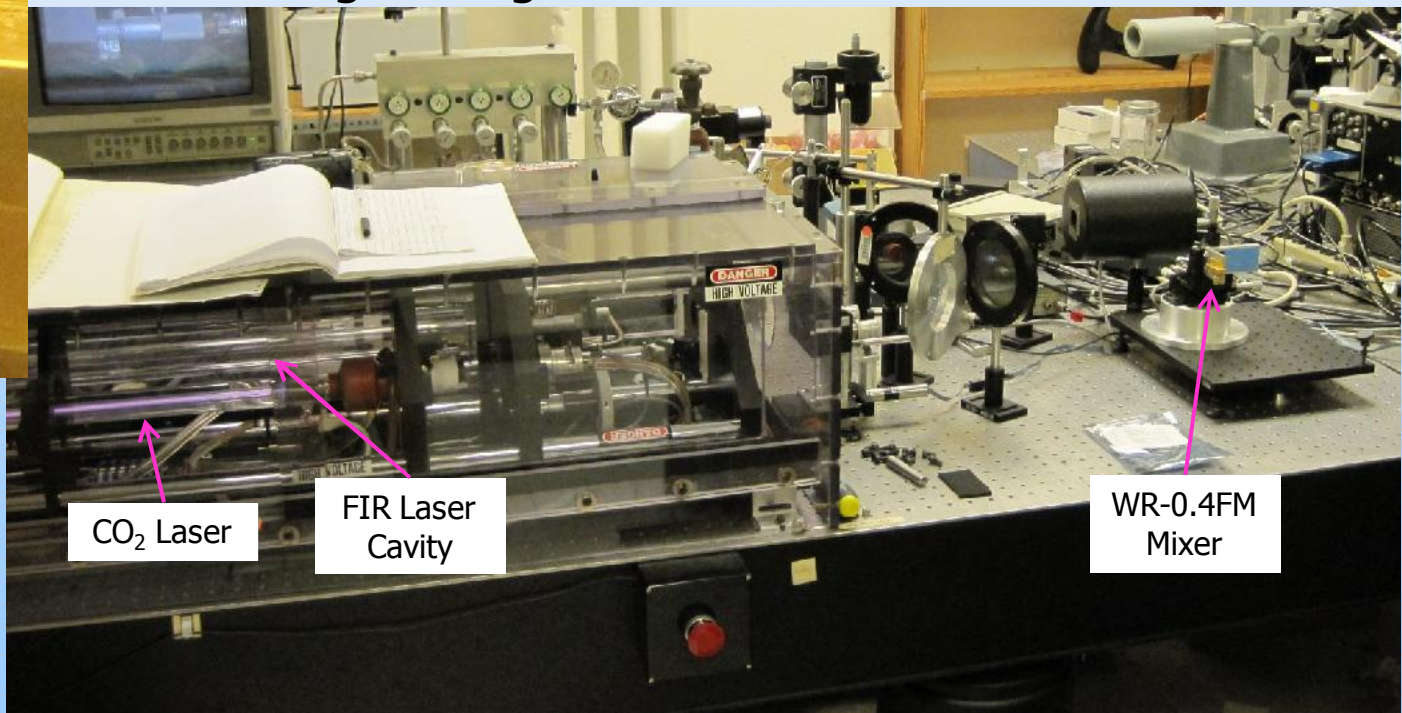
IF/DC  
Coax

- Planar Schottky Diode Mixer
  - Integrated Schottky Diode
  - WR-0.4 Waveguide
  - Integrated Diagonal Horn
    - 25 dB Gain (nom.)
    - Beam Waist Radius 0.27 mm

Mixer during testing at UVA Far-Infrared Receiver Lab



Diagonal Horn



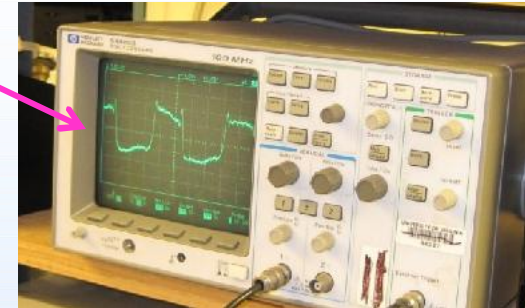
CO<sub>2</sub> Laser

FIR Laser  
Cavity

WR-0.4FM  
Mixer

# VDI WR-0.4 (1.8-2.8 THz) Mixer

- Responsivity testing using 2.5 THz Laser
    - 5-10 mW available from laser
  - Shine FIR Laser directly onto mixer
    - No focusing optics used
      - Laser beam waist  $\sim 9$  mm
      - Mixer beam waist 0.27 mm
  - Measured peak video response of 7 mV for 4 mW laser power
    - Assuming the laser is gaussian then  $\sim 14$   $\mu$ W coupled to mixer
    - However, moving mixer in beam varied response from 3-7 mV
      - Beam not perfectly gaussian
  - Responsivity estimated to be in the range of 200-400 V/W
    - Beam pattern measurements underway to determine a more accurate number
- Video response from mixer
    - Ibias=1  $\mu$ A
    - No video amp used
    - Laser chopped at 22 Hz



Mixer during testing at FIRLab

