KAJIHARA LAB.

[Manufacturing and THz microscopy]

Department of Mechanical and Biofunctional Systems

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Manufacturing Science Fundamentals

Department of precision engineering

Novel THz measurement

Visualizing local phenomena on material's surface

Terahertz wave (wavelength: 10 μm ～ 50 μm) contains many important spectra of matters due to molecular vibration, lattice phonon, and biomolecular motion. We are developing a near-field microscope, which "passively (without external illumination)" detects spontaneous THz photons originated from localized phenomena at "nanoscale" resolution. We are also developing a new jointing manufacturing technique.

- ◆Passive THz near-field microscopy without external illumination (spatial resolution = 60 nm)
- ◆Non-destructive THz nano-thermometry
- ◆Product evaluation based on THz photoelastic method
- ◆Novel Jointing manufacturing

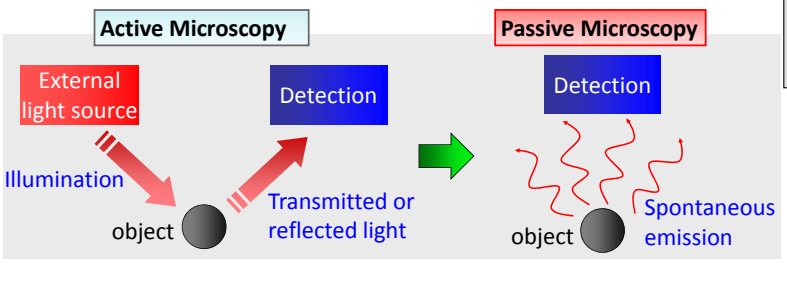
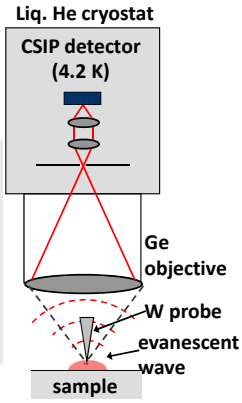


Fig.1 Conventional active measurement and our passive measurement



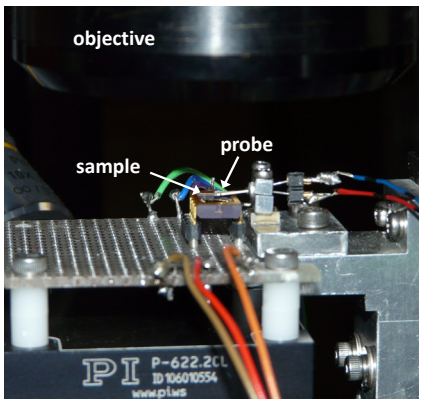


Fig. 2 Passive THz near-field microscope

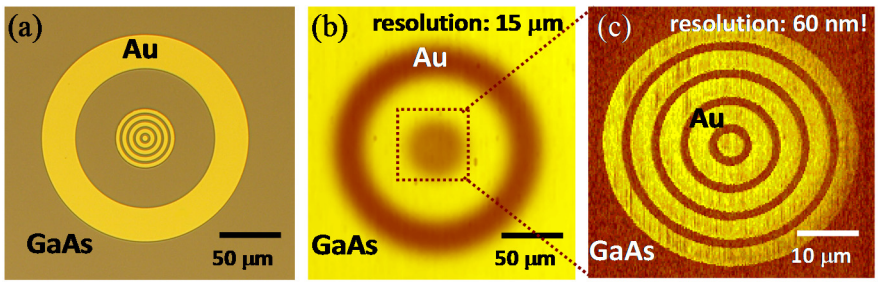


Fig.3 (a) Microscope image (b) Passive far-field image (c) Passive near-field image

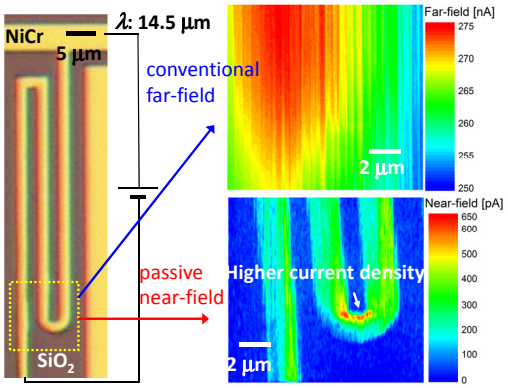


Fig. 4 Current density distribution mapped with THz nano-thermometry