

KAJIHARA LAB.

[Terahertz microscopy and Manufacturing science]

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Manufacturing Science Fundamentals

Department of precision engineering

Terahertz and Joining Science

Novel THz microscopy and Joining science

Terahertz wave (wavelength: $10\ \mu\text{m} \sim 50\ \mu\text{m}$) contains many important spectra of matters due to molecular/lattice vibration and biomolecular motion. We develop a novel near-field microscope, which “passively (without external illumination)” probes spontaneous THz photons derived from local phenomena with “20 nm” resolution. We are also studying the joining mechanism between metal and polymer, and developing a non-destructive evaluation method of residual stress in polymer products.

- ◆ Passive THz near-field microscopy with 20 nm resolution.
- ◆ THz nano-thermometry.
- ◆ Nondestructive evaluation of residual stress evaluation in polymer products.
- ◆ Metal-polymer joining with surface nano-structure.

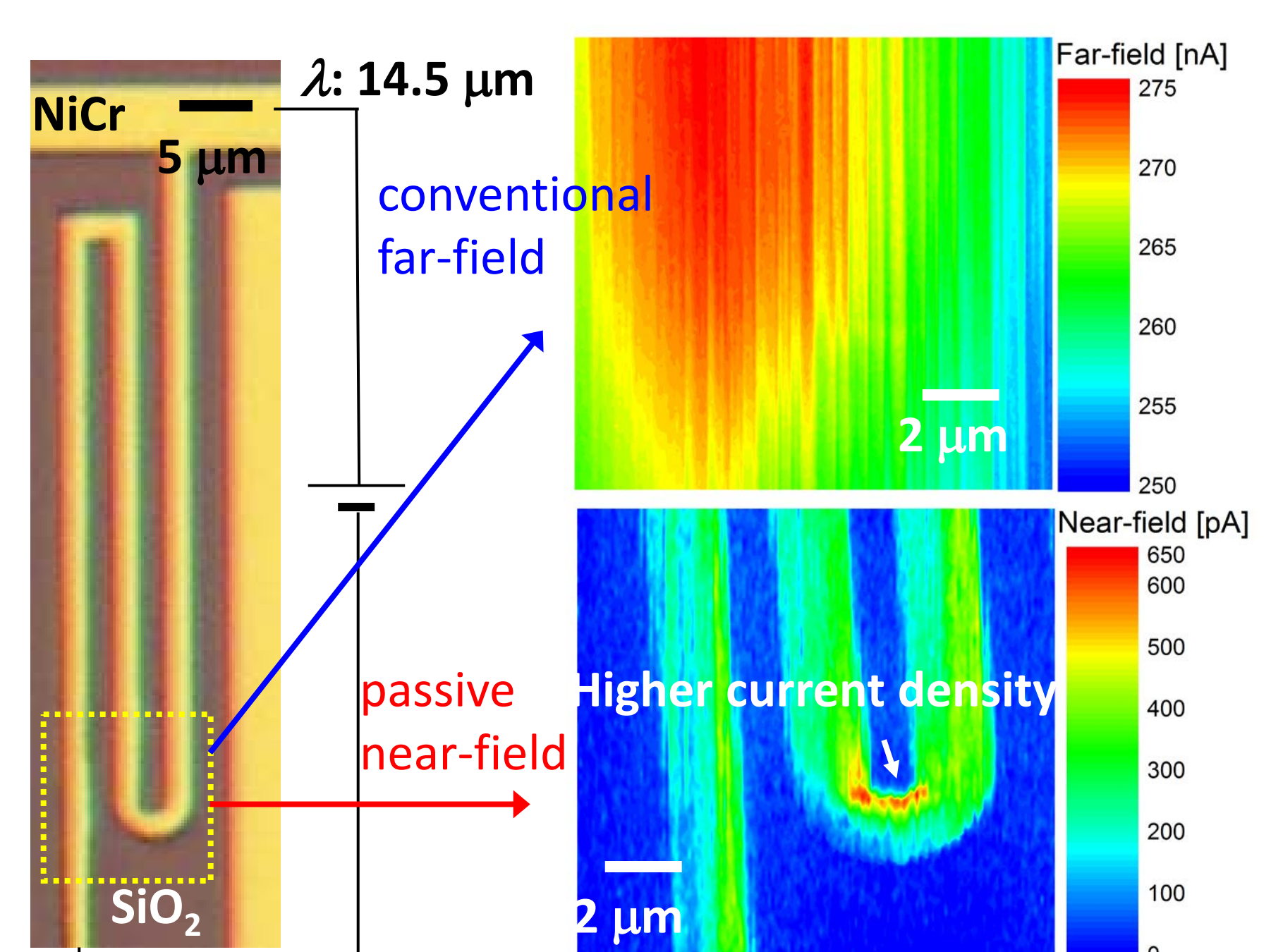
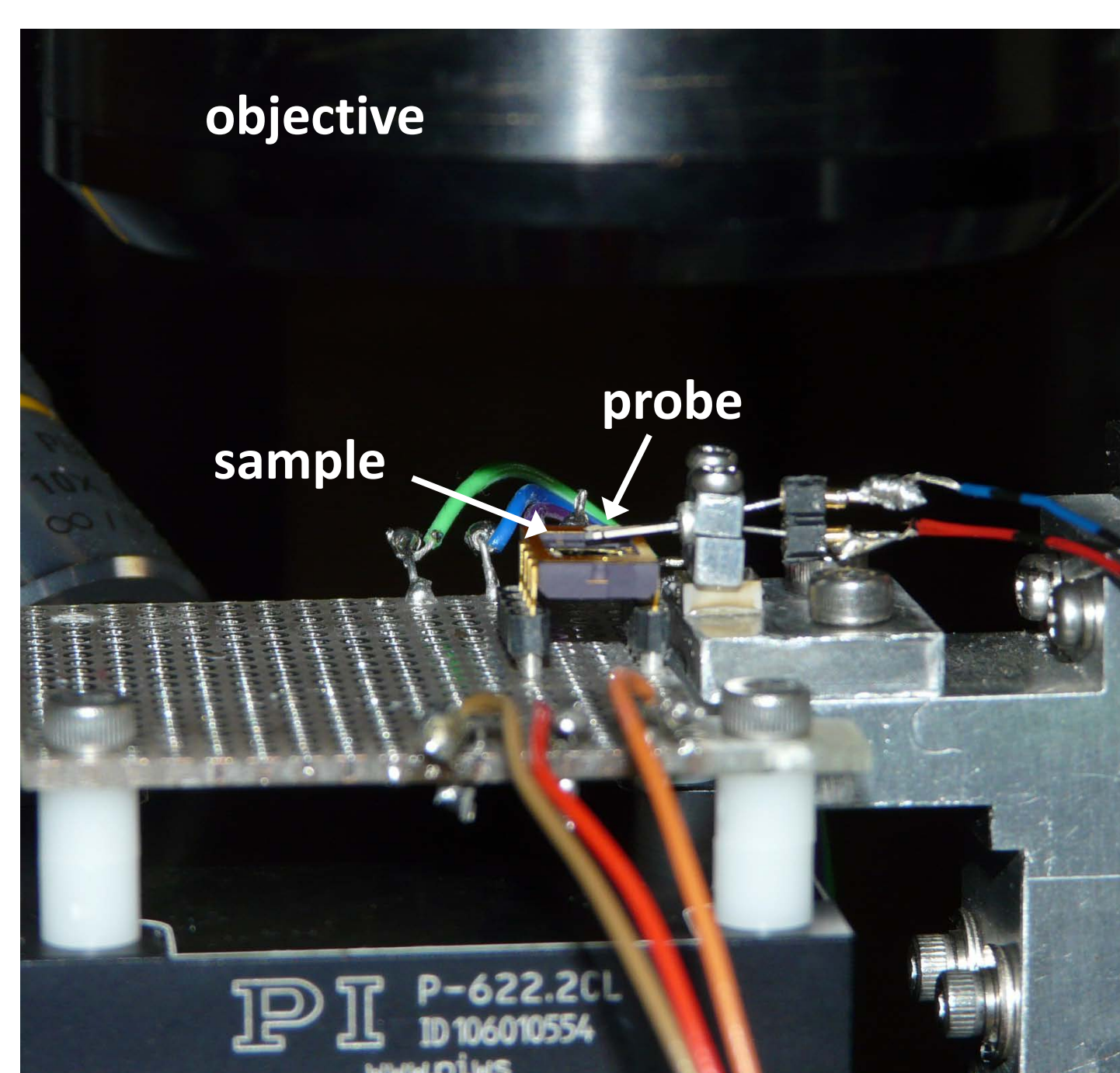
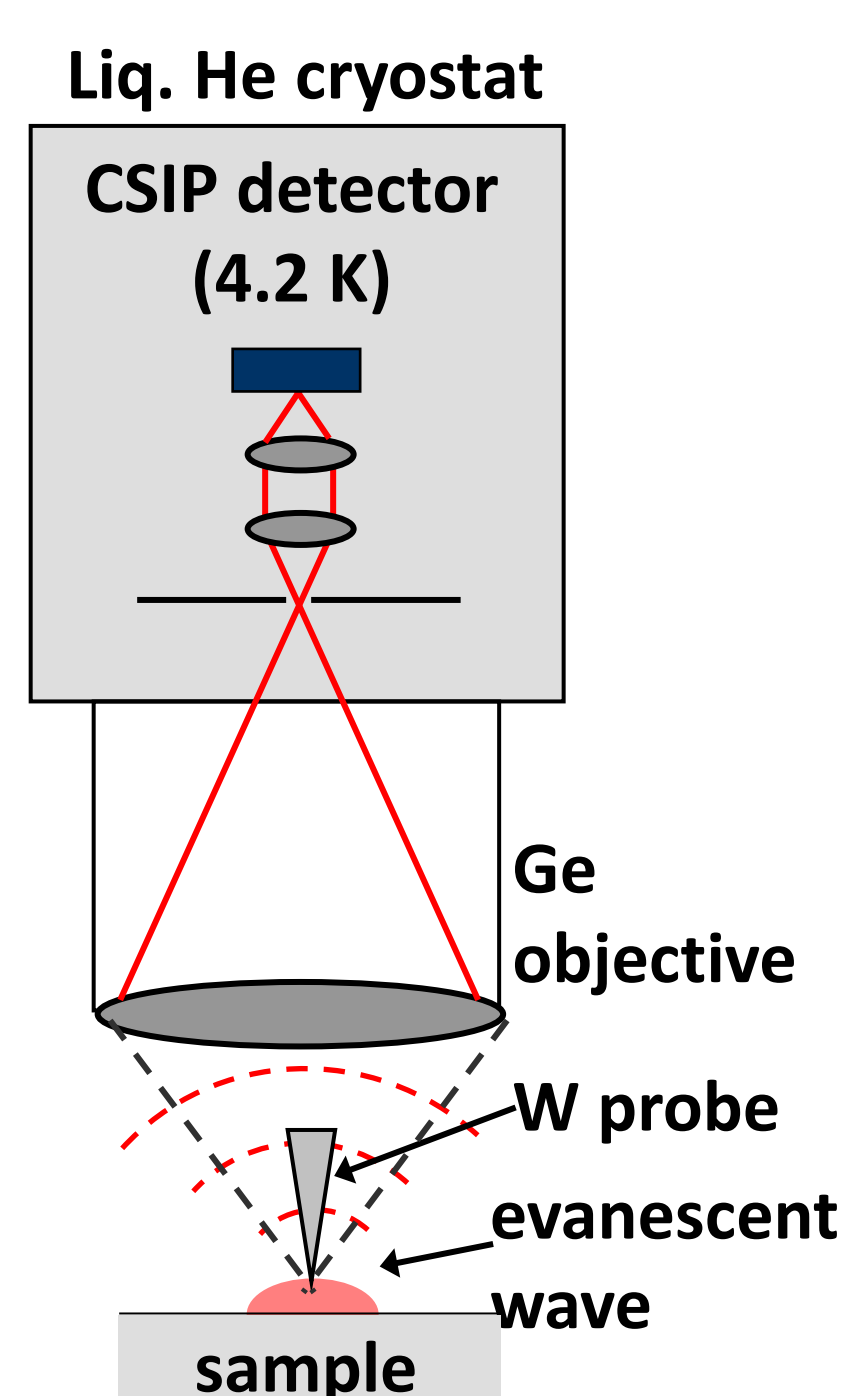


Fig.1 Passive near-field microscopy Fig. 2 Photo of the microscope

Fig. 3 Nano-thermometry

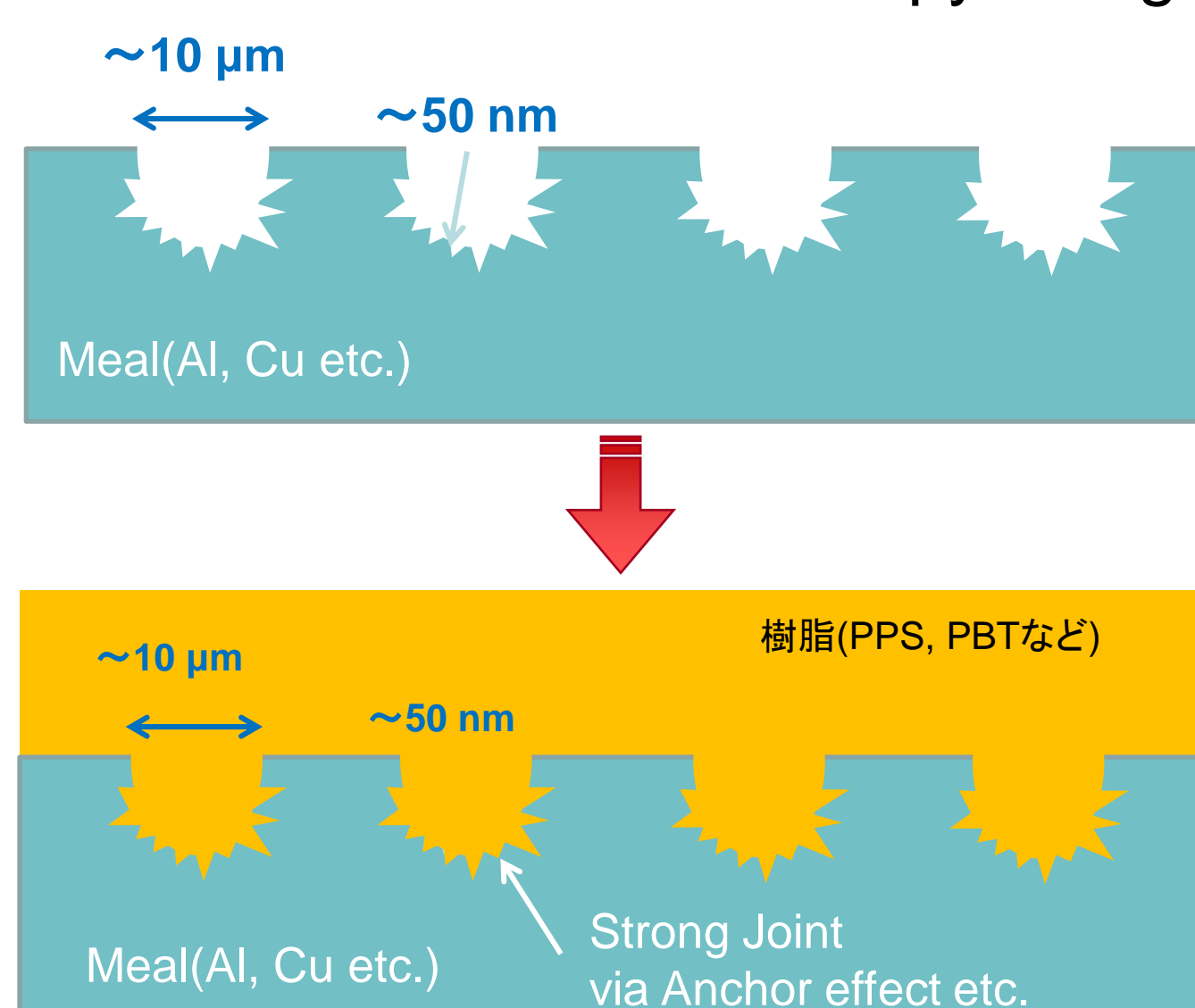


Fig. 4 Concept of metal/polymer joining

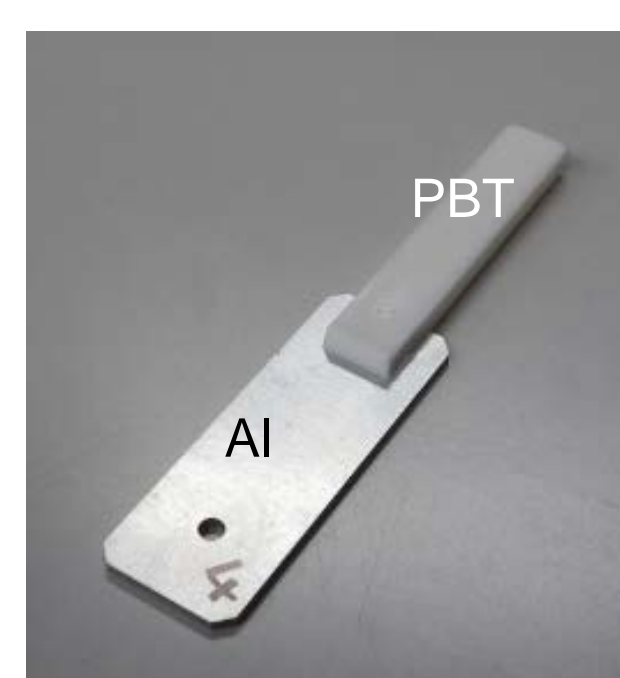


Fig. 5 Joined product

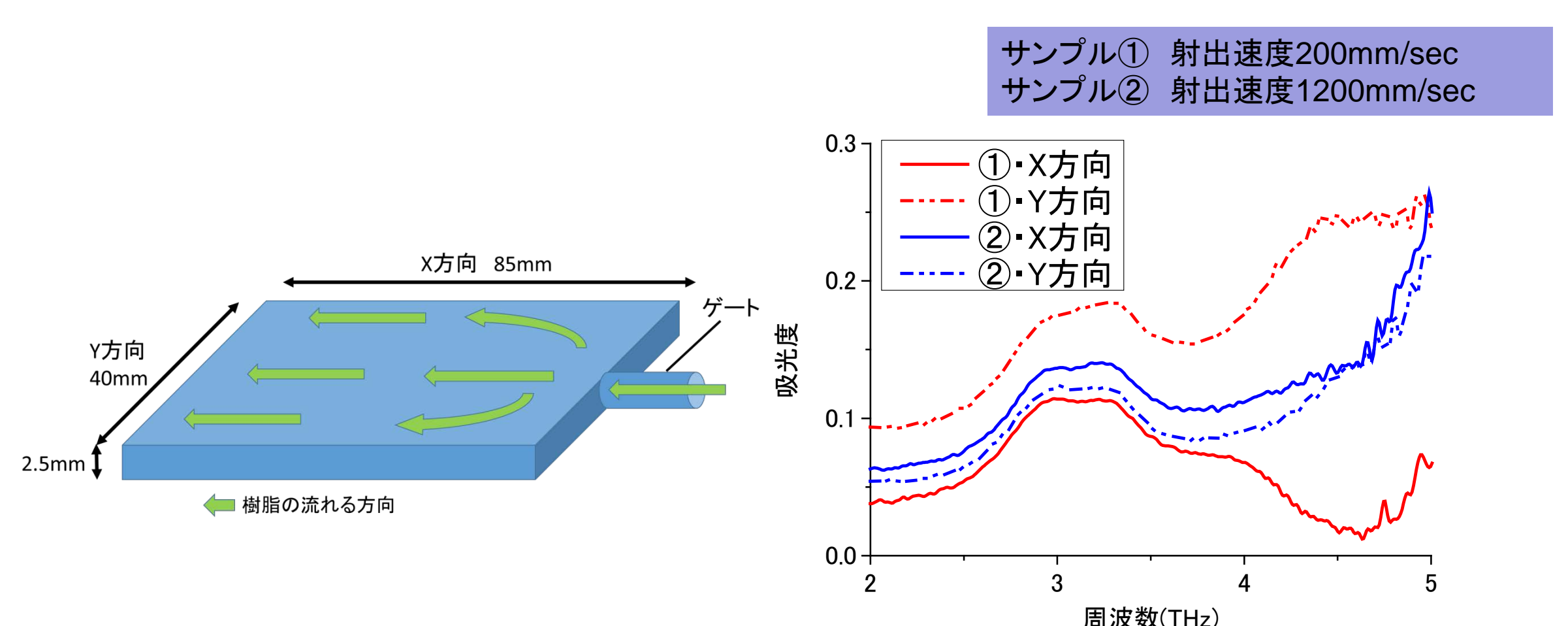


Fig.6 Residual stress evaluation