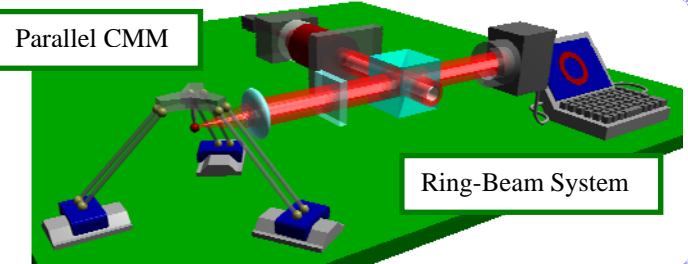


3D Displacement Measurement Using Ring-beam

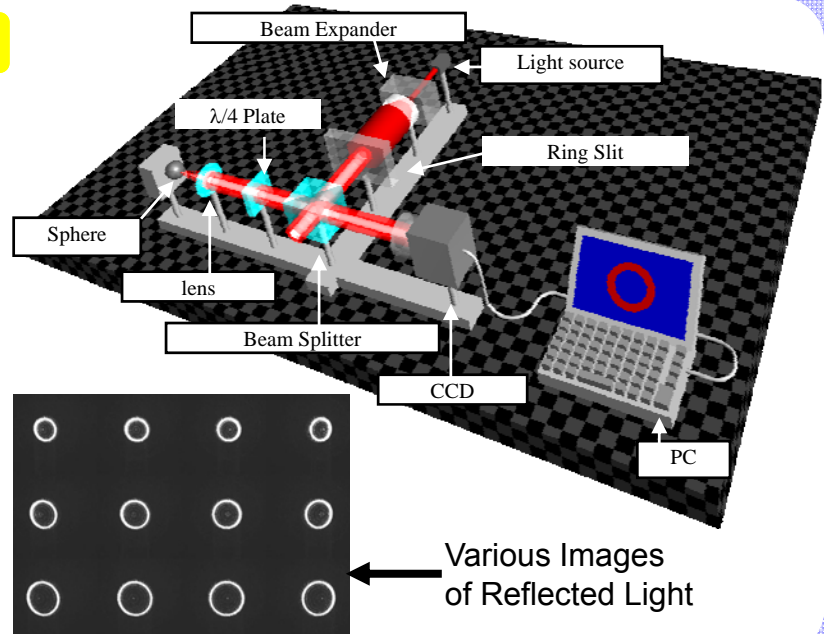
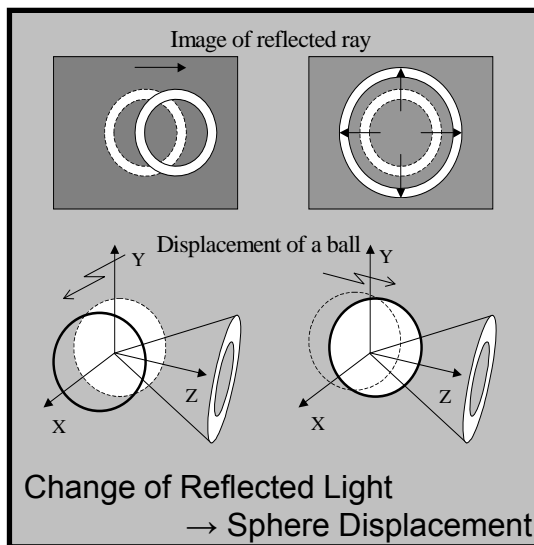
PhD Student: Shin Usuki

Introduction

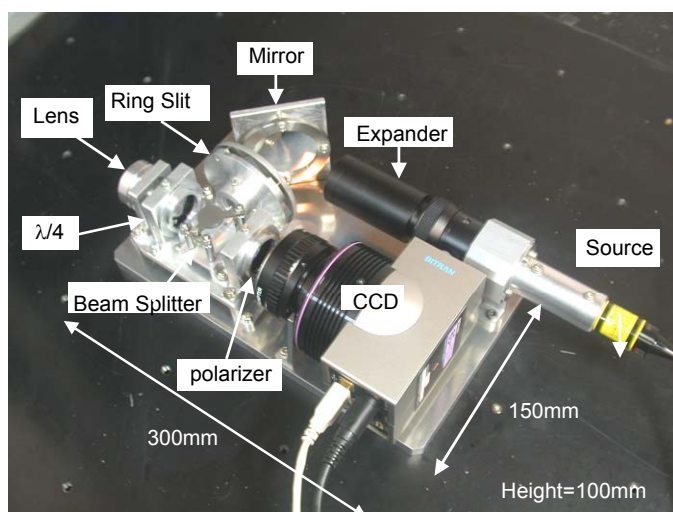
3D Displacement (Position) Measurement with High Accuracy and Measurement Flexibility to Calibrate the End-effector of the Complicated 3D Mechanism



Measurement Principle



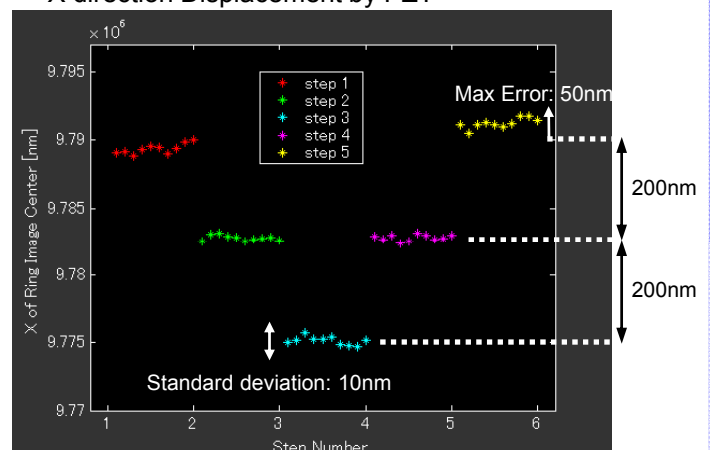
Step Displacement Measurement & Analysis



Developed Equipment

- Compact & Mobile -
- Low Center of Gravity -
- Easy to Assemble -

Measurement of Target Sphere with 200nm Step X direction Displacement by PZT



Measurement Result

(X direction repeatability: 10nm, accuracy: 50nm)
 (Y direction repeatability: 20nm)
 (Z direction repeatability : 100nm)
 Range (XD x YD x ZD: 0.1mm x 0.1mm x 0.5mm)

Ref.) S. Usuki, et. al., Improving the Accuracy of 3D Displacement Measurement using Ring-Shaped Laser Beam and High Resolution CCD, Proc. 4th International Conference of the European Society for Precision Engineering and Nanotechnology (euspen2004), pp328-329, 2004