Design of a nanomachining probe with nanometrology function

A diamond cutting tool as the probe for both machining and measurement

Precision nanofabrication to an accuracy of nanometers

Necessary for measuring the machined surface on the machine and for identifying error sources in the machining process

- Correspondence between the measured points and the machined points
- Application to ultra-precision cutting process which requires a high stiffness

Instrument evaluation experiment

Design and construction of the instrument

- High stiffness (for machining)
- Stability, Small contact force (for measurement)
- Resonance frequency (for machining and measurement)

Evaluation of measurement force

Low measurement force of 0.01mN

Result of profile measurement

Realized profile measurement by the Nanomachining probe