

# MICRO BEAM LINE SYSTEM

## WITH AUTOMATIC BEAM FOCUSING SYSTEM

### MICRO BEAM LINE

HAKUTO has started selling the Japanese-made microbeamline system.

This system was developed at Tohoku University and is used in Japan in combination with 1.7MV accelerator manufactured *by National Electrostatics Corp.*

Accurate composition and density analysis of minute areas is possible with a microbeam line that can focus high-speed ion beams down to a minimum of  $1 \mu\text{m}\phi$ .

In addition, the unique automatic beam focusing system greatly reduces beam adjustment work, making it possible to complete the adjustment within an hour.

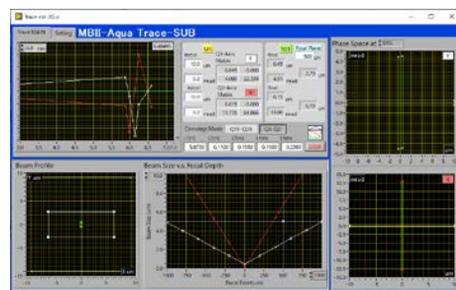
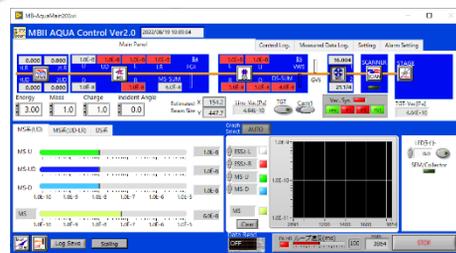
### AUTOMATIC BEAM FOCUSING SYSTEM

Tohoku-University developed an automatic beam-focusing system to reduce the experimental configuration time for a submicrometer-scaled(\*) beam probe of MeV ions with various analytical applications.

Parasitic aberration due to misalignment and astigmatism must be eliminated or minimized to obtain an ideal beam spot size of less than  $1 \times 1 \mu\text{m}^2$ , because astigmatism from excitation error and axial misalignment broaden the beam.

The system involves a two-stage process of contrast and phase-difference detection that includes an automated minimization algorithm for astigmatism.

The contrast method focused a proton microprobe to approximately  $1 \mu\text{m}^2$  within 30 min, without the need for manual control when rotational misalignment was not present, while the phase-difference method successfully reduced the rotational error of lenses.



(References: Nuclear Instruments and Methods in Physics Research B 496 (2021) 1–8)

### Features

- Beam spot size  $\geq 1 \mu\text{m}$  (\*submicrometer-scaled depend on accelerator)  
(Object:  $10 \times 40 \mu\text{m}^2$  / Divergence:  $0.2 \times 0.2 \text{mrad}^2$ )
- Compact beamline length: 7m (from Object to TGT)
- Automatic beam-focusing system (Set up: 30min for  $1 \mu\text{m}$ )
- User-friendly software system
- Possible to be upgraded and customized an existing system

\* Please visit our booth or WEB page for more details !



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