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**Scanning tunneling microscope-cathodoluminescence (STM-CL) imaging of the GaAs/AlGaAs (110) cross-section: evaluation of spatial resolution and imaging area shift** KENTARO WATANABE, Department of Applied Physics, School of Engineering, The University of Tokyo, YOSHIAKI NAKAMURA, Quantum-Phase Electronics Center, Department of Applied Physics, School of Engineering, The University of Tokyo and CREST-JST, SHIGEYUKI KUBOYA, RYUJI KATAYAMA, KENTARO ONABE, Department of Advanced Materials Science, School of Frontier Sciences, The University of Tokyo, MASAKAZU ICHIKAWA, Quantum-Phase Electronics Center, Department of Applied Physics, School of Engineering, The University of Tokyo and CREST-JST — We studied local optical properties of AlGaAs/GaAs multilayer structures by scanning tunneling microscope cathodoluminescence (STM-CL) spectroscopy, where low-energy ( $\sim 100$  eV) electrons field-emitted from STM tips were used as bright excitation sources. The STM-CL measurements were performed at the (110) cross-sectional surface of the AlGaAs/GaAs multilayer structure. We found that the field-emitted electron beam (FEEB) diameter mainly determined the spatial resolution of this system in STM-CL spectroscopy by evaluating some contributors: the thermalization length and the diffusion length of generated hot electrons. We also clarified that the shift of the STM-CL measurement position from the STM tip position was caused by the FEEB angled from the surface normal.

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