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**The optical assembly of a micro-electron column and its application.** WONKWEON JANG, JONGSEON PARK, Dept. of Computer and Applied Physics, Hanseo University, SUNGSOON PARK, HOSEOB KIM, Dept. of Advanced Materials, Sunmoon University, KWANGHO CHOI, Div. of General Education, Namseoul University — Micro-electron column has been intensively studied due to its high potential for application to multi-electron beam system. Its full length is less than 15mm, very short comparing that (1~2m) of conventional electron column. Research is focused on how it can be assembled in shrunk size and work at the same or better level. The resolution and performance of a micro-electron column is determined by factors of spherical, chromatic aberration, astigmatism, coma, etc., and these factors critically depend on size, roundness of the lens aperture and precise alignment. To date, many precise equipments have been used, such as aligner, piezoelectric transducer (PZT), and scanning tunneling microscope (STM). However, those methods were difficult to use and complicated. In this paper, we used the laser diffraction pattern method for optical alignment of micro-electron lenses, and laser bonding was employed for exact fabrication of micro-lenses within 4% error. After assembled it was fully functioned in nano-scale reading with current image. Application to LCD tester and comb wire imaging in micro-, nano-scale were successfully demonstrated.

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