

PREFACE

This annual report reviews the research activities of the Laboratory of Advanced Science and Technology for Industry (LASTI) in the academic year of 2012 (April 2012 –March 2013) including activities using a 1.5GeV synchrotron radiation facility “ NewSUBARU ” and compact 15-MeV linac "LEENA" at the site of SPring-8. Other research activities of the micro and nanoscale carried out energetically at CAST building.

Topics of the NewSUBARU research activities of this year are as follows. First is achievements of a small linear electron accelerator LEENA. This accelerator was reconstructed and generation of THz Smith-Purcell radiation was started. Second is developments of LSI mask pattern observation system for extreme ultraviolet lithography (EUVL) using lensless scatterometry microscope. Third is a new irradiation hutch for gamma-ray beam source was added by collaboration with Konan University. The user use of gamma-ray beam of photon energy up to 76.3 MeV was started. Generating maximum gamma-ray power was 0.33mW. Fourth is the top-up beam current of NewSUBARU was enhanced from 250 mA to 300 mA. This was achieved by longer lifetime as a result of an additional installation and optimization of sextupole magnet families.

Furthermore, most of our research activities are being conducted in collaboration with industries, government research institutes and other universities. NewSUBARU beamlines are intensively used by companies. We will continue to respond to the community's demand by offering new science and technologies.



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