Abstract Submitted
for the GEC10 Meeting of
The American Physical Society

High resolution measurement of silicon wafer temperature using super-continuum light on optical low-coherence interferometry TAKEHIRO HIRAOKA, Graduate School of Engineering, Nagoya University, CHISHIO KOSHIMIZU, Yamanashi Technology Development Center, Tokyo Electron AT, TAKAYUKI OHTA, Faculty of Systems Engineering, Wakayama University, MASUFUMI ITO, Faculty of Science and Technology, Meijo University, NORIHIKO NISHIZAWA, MASARU HORI, Graduate School of Engineering, Nagoya University — The control of the wafer temperature is important, because etch rate and etch profile are sensitive to the wafer temperature in the plasma etching. We have developed a monitoring system for temperature of each layer in multi-layered wafers using optical fiber-type low-coherence interferometer, which used Super Luminescent Diode as a low-coherent light source. In this study, we focused on the Super-Continuum (SC) light which is laser with the broad wavelength width from 1300 to 2000nm, in order to improve the accuracy of temperature and the resolution of film thickness measurements. We discussed temperature dependence on the optical path length of Si wafer using SC light source, and we compensated the wavelength dispersion of SC on Si wafer. The temperature deviation using the SC light was improved to be 0.4 degree C from 1 degree C using SLDs. We have measured temperatures of 8.55 μm-thickness SiO_2 film and Si on SiO_2/Si substrate simultaneously.

Takayuki Ohta
Wakayama University

Date submitted: 07 Jun 2010 Electronic form version 1.4