

Commission A (Electromagnetic Metrology) Activity Report

July 2009 - October 2009

1. Activities in the field of electromagnetic metrology

At National Institute of Information and Communications Technology (NICT), a training program for engineers and researchers in the field of time and frequency metrology in Asia-Pacific region was hold from October 15 to October 23, 2009. In total, 12 people from 9 countries, i.e. China, Philippines, Indonesia, Sri-Lanka, Kazakhstan, Syria, Papua New Guinea, Thailand, and Singapore, participated in the program. Hand-on seminars and lectures were given by the staffs of NICT. Regarding the research and developments, a closed-loop frequency lock system to the $^{40}\text{Ca}^+$ single ion trap system has been developed and the frequency stability of the system is being evaluated. In addition, the fundamental function of the optical lattice clock using ^{87}Sr atoms has been completed and the spectrum of the clock transition of the Sr was successfully observed. At Kyoto University, laser cooling of single Yb^+ and Ba^+ ions in 1mm-size traps is being investigated. At Tokyo Metropolitan University, low-power-consumption CPT atomic clock using ^{85}Rb D1-line has been investigated. At Kinki University, phase control of 2-ring type Ramsey cavity was investigated.

The conference of 7th Japan Metrology Forum was held in October 30th 2009. In the conference a tutorial seminar on radio wave metrology was planned and a research scientist of NMIJ/AIST made a lecture on the technology of the measurement of S-parameters in radio wave and microwave region. He is also disseminating the concept of metrological traceability and uncertainty evaluation methods in the many conference and workshop, i.e. Thai and Japan Microwave 2009, ARFTG 74th Microwave Measurement Conference, etc.. In July 2009, NMIJ/AIST and NPL, UK, launched the Joint Research Project, supported by NEDO, to establish the uncertainty evaluation method in vector network analyzer measurements and millimeter and sub-millimeter waveguide standardization.

2. International meetings

The meetings of Study Group 7 (Scientific Services) and its working parties of

ITU-R (Radio-communication Sector of International Telecommunications Union) were held in Geneva from September 7 to September 15, 2009. A new draft recommendation to establish trusted time source for time stamp services was proposed to the Working Party 7A (Time signals and frequency standard) from Japan and it was approved by the Study Group. The proposed recommendation has been circulated to the member states of ITU for adoption and it is expected to be adopted after December 23, 2009 if there are no objections.