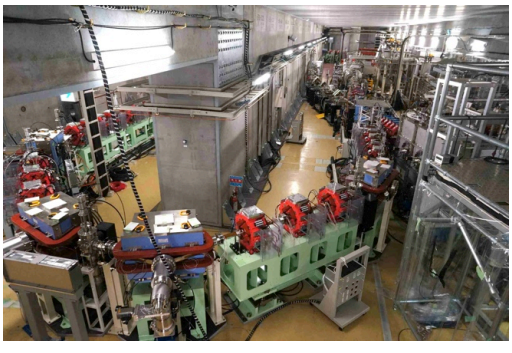
PHOTON FACTORY, IMSS, KEK

It is our great pleasure to send our fist facility report of this year in this good season. This year, we already experience rather hot days in Tsukuba even at the end of May but work hard to deliver the photon beam and utilize it with users as efficiently as possible. Here, we introduce two important events that we have had recently. The first is the IMSS Science Festa held on March 18 and 19, 2014. This is the event that unites two traditional symposia, that are, the PF symposium and MLF symposium. As you know, the MLF, i. e., Materials and Life Science Experimental Facility at J-PARC also belongs to our institute, IMSS, and we have had joint and separate sessions between the two facilities. As the joint sessions, we have set three main topics, which are "The roles of hydrogens and spins in solid state physics," "Contribution to a sustainable society," and Biological science and quantum beam." In particular, the lecture by Prof. H. Hosono at Tokyo Inst. of Technology was on the recent discovery of a hydrogen-doped iron pnictide, which has been revealed to have another antiferromagnetic parent phase of superconductivity in a highly electron-doped region, in addition to that in the lightly electron-doped region. This discovery was accomplished based on the collaborative use of our multi beams, namely, synchrotron radiation, neutron, and muon. The photo taken during the break time shows Prof. M. Takada at SPring-8, Prof. K. Yamada at IMSS, Mr. Kudo at MEXT, Prof. Y. Fujii at CROSS, and Prof. Y. Murakami and Prof. H. Abe at PF, from left to right.

Second, we report our new technological accomplishment, which is the realization of energy recovery operation in our newly constructed compact Energy Recovery Linac (c-ERL). The c-ERL is a demonstration machine of an ERL, and we proceed with the R&D using that machine. In both of the ERL and c-ERL, an electron beam that has finished running around the machine is returned to the main super conducting cavity with the phase opposite to the initial phase. This leads to the deceleration of the beam and the energy is recovered for the next use, while the beam itself is guided to the beam dump and stopped safely. We began the construction in 2012 in the cooperation with JAEA, The University of Tokyo, UVSOR, Hiroshima University, Nagoya University, etc, and succeeded in the electron beam acceleration at the injection part in May 2013. On March 12 of this year, we have finally passed the examination of this energy recovery operation by the Nuclear Safely Technology Center(NSTC). The photo shows the structure at one end of the machine. On the right-hand side, we see the 500 KeV high-brilliance electronic gun, from which the electron beam is extracted. This beam is first accelerated up to 2.9 MeV by a super conducting cavity for injector, and the receives further acceleration up to approximately 20 MeV by a main cavity. We are now in the phase of improving the beam performance toward a full operation at 35 MeV and 10 μA, through machine adjustment.



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