

## Development of a Main Linac Module for Compact ERL Project

K. Umemori, T. Furuya, H. Sakai, T. Takahashi, KEK, Tsukuba, Ibaraki, Japan

K. Shinoe, ISSP, University of Tokyo, Kashiwa, Chiba, Japan  
M. Sawamura, JAEA, Tokai, Naka, Ibaraki, Japan

A construction of the Compact ERL is planned in KEK, Japan. A demonstration of the performance of the main linac super-conducting accelerating system is one motivation of the project. We have been designing a cryo-module, which works under CW operation, and contains two 9-cell cavities, with input couplers, frequency tuners and HOM dampers. Most of these components have been specially developed for ERL operation. Two prototype of the 9-cell cavity were constructed. Cavity performances were tested with vertical tests. Both cavities can achieve to more than 20 MV/m. High power component tests have been carried out for input coupler. At first, large temperature rise was observed at a ceramic window part due to unexpected dipole resonance. After that, new version of window was designed and successfully passed 20kW CW power with reflection condition. Prototypes of HOM damper were also constructed. Cooling tests have been performed for them to verify cooling ability against more than 100W heat load, under vacuum condition. A cryo-module will be completed in 2012, and cooling tests and beam tests will follow.