Beam study results for J-PARC linac energy upgrade

Y. Liu[1,3#], T. Maruta[1,3], A. Miura[1,2], and K. Futatsukawa[1,3]

[1]*J-PARC Center, Tokai, Ibaraki 319-1195, Japan*
[2]*JAEA, Tokai, Ibaraki 319-1195, Japan*
[3] *KEK, Tsukuba, Ibaraki 305-0801, Japan*

 # a corresponding author: E-mail yong.liu@j-parc.jp

J-PARC linac was successfully upgraded from 181MeV to 400MeV in Jan. 2014. Settings for 400MeV/15mA user operation and 400MeV/25mA beam test were established with acceptable beam loss/ residue radiation doses, acceptable output orbit, energy jitter, emittance for RCS injection. Beam loss mechanism was analyzed with comparisons between measurements before and after the upgrade. Emittance growth and halo were studied, and possibility of improvement was demonstrated. Optimization with tuning output momentum for RCS loss mitigation was carried out. Studies and measurements for longitudinal phase space and wake field at the newly installed ACS part were also performed.