Properties of the Vertical Deformation of the J-PARC Linac Tunnel

T. Morishita#

J-PARC Center, Tokai, Ibaraki 319-1195, Japan

 # E-mail: takatoshi.morishita@j-parc.jp

The properties of the vertical deformation are analyzed using periodically surveyed results and the floor level measured by the hydrostatic leveling sensors. J-PARC linac has finalized its precise alignment at the end of summer 2006. Since then, the deformation of the linac accelerator tunnel was the small enough to keep the soundness of the alignment accuracy for five years without re-alignment. All accelerator components were re-aligned after the huge earthquake in March 11th, 2011[1], however, the stability of the linac tunnel became worth after that earthquake. Figures 1 show the long-term vertical deformation of the linac floor. The vertical deformation is typically 1 mm until 2010. However, the local settlements appeared after 2011 at the upstream section. Also, the floor height is affected by the environmental conditions such as seasonal change, weather, earthquakes, and so on. The degrees of these short-term movements are identified by continuously monitored floor height by the slow ground motion monitoring system [2] in the linac tunnel.

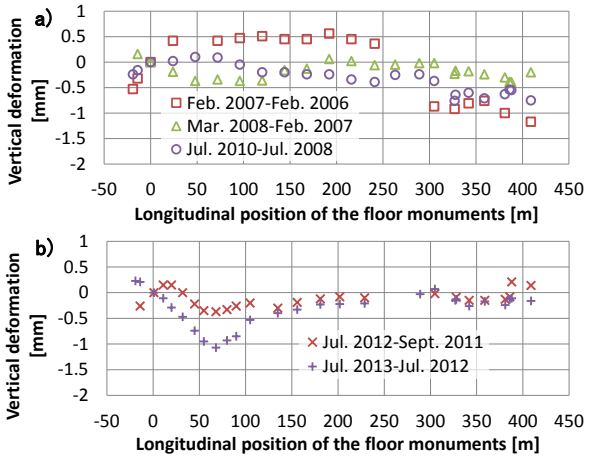

Fig. 1, Vertical deformation of the linac floor for the periods of a): from 2006 to 2010, and b): from 2011 to 2013.

References

[1] T. Morishita, H. Asano, and M. Ikegami, Procs. of IPAC2011, San Sebastian, Spain, 2601 (2011).

[2] T. Morishita and M. Ikegami, Nucl. Instrum. Meth. **A602**, 364 (2009).