

Slow Ground Motion and Large Future Accelerator,

A. AKIYAMA, Y. KANAZAWA[†], K. KUDO,
S. TAKEDA, Y. TAKEUCHI, KEK, [†]ATC -

The power spectrum density of the ground motion is studied for the construction of large scale and high luminosity machines. Although the tolerance for errors of the linear collider strongly depends on the design of the machine, they require severe tolerance for the machine components. The natural level of seismic vibrations has been usually considered as seriously affecting machine operation assuming that slow ground motion much less than characteristic frequency of an accelerator gives complete space and time coherence of the machine displacements. Our experimental results, however, suggests being frequency dependent structure for the space coherence in the low frequency range. We also observed the space coherence as a function of distance. A long term drift and slow fluctuations were studied on the different crystal structure to get the detailed power spectrum density. We use a water-tube-tiltmeter for the spectrum below 1 mHz and a broadband seismometer to get the spectrum from 10 mHz to 100 Hz. Both power spectra is interpolated using electronic level. We give some detailed discussions about the relation between the linear collider and ground motion using the observed data.