

Instability due to the Longitudinal Higher Modes in the Electron Storage Ring, S.K. NAM, Kangwon National University - The bunch length, the average rms energy spread as function of current and the threshold current due to the potential well distortions are calculated by the simulation method using the long range wakefield. For the simulations we take the synchrotron tune of 0.0059, momentum spread of $7.15e-4$, energy 2 GeV, bunch length of 0.0078 m, 5 azimuthal space harmonics and 60 mesh points. The growth rates and frequency shift with the longitudinal higher order modes are calculated by the air-bag model and water bag model and also calculated by the eigenmode analysis of Sacherer's integral equation. We have calculated the higher order modes (TM010, TM011, TM020 and TM021 modes) to be troublesome among 15 modes and the coupled bunch instability growth rate for the higher order modes of the RF cavity.