Hysteresis Phenomena in Bunch Lengthening at the KEK Accumulation Ring, T. IEIRI, K. OIDE, KEK - The bunch length was measured as a function of the beam current at energy of 2.5 GeV. When the beam current increased and decreased, the bunch length showed a hysteresis phenomenon i.e. it had two values in a region of the current. The hysteresis depends on the cavity voltage, but occurs regardless of tuning the rf system. In order to investigate the hysteresis, bunch lengthening and a longitudinal instability were simulated using a calculated wake potential of the ring. The wake potential includes cavities, bellows and masks. The simulation showed that a bunch became unstable between two stable regions as a function of the energy spread. A current region where two bunch lengths exist agrees between the simulation and the experiment, which may suggest the hysteresis. By changing a number of the components in the simulation, one concludes that the hysteresis is due to an impedance combination between cavities and unshielded bellows. The simulation also showed a rather low threshold current of an instability, which was also confirmed by an observation.