

## **Tracking Studies in the Longitudinal Phase Space for the TESLA Damping Ring Design,**

R. BRINKMANN, C. BURNTON,  
R. WANZENBERG, DESY; T. WEILAND, TU  
DARMSTADT - The TESLA Linear Collider will require bunch lengths in the range of 0.3 to 0.7 mm at the interaction point (IP) for the different parameter sets presently under discussion. In order to achieve this the bunches leaving the TESLA Damping Ring will pass a single stage bunch length compressor. To keep the demands of the latter moderate, the TESLA damping ring needs to fulfill limitations in respect to the longitudinal phase space (in the range of 4 mm to a maximum of 1 cm for the bunch length and 0.1 % for the energy spread). The possibility of bunch lengthening effects and other instabilities due to wakefields need to be and have been studied. The assumed wakefields of various components are presented and incorporated in a tracking method using a quasi-Green's-function approach to simulate their effect on the longitudinal dynamics of the beam. The results are compared to analytical estimations.