

CALCULATION OF ELECTROMAGNETIC
EIGENFIELDS FOR CYCLIC BEAMS
OF RELATIVISTIC ELECTRONS
BY THE METHOD OF RETARDED
POTENTIALS

V.V. Dolgoplov, Yu.V. Kirichenko

National Scientific Center
"Kharkiv Institute of Physics and Technology"
(1, Academichna Str., Kharkiv 61108, Ukraine)

S u m m a r y

Electromagnetic eigenfields of a cyclic high-current relativistic electron beam (REB) are calculated by using the method of retarding potentials. The calculation are performed in the zero and first approximations in the amplitudes of deviations of beam parameters from equilibrium values. The formulae derived can be used to investigate the stability of cyclic beams under excitation of oscillations in arbitrary cyclic systems, in particular, in electromagnetic radiation sources, e.g., storage rings. As an illustration, the REB stability in a betatron is discussed.