

Wave-Optical Properties of Synchrotron Radiation and Electron Beam Diagnostics,
N.V. SMOLYAKOV, Hiroshima Synchrotron Radiation Center & Department Of Material Science, Hiroshima University - Wave properties of synchrotron radiation (SR), generated by a relativistic particle in an uniform magnetic field, were analyzed. Starting from exact solutions of the Maxwell equations, it turned out possible to obtain precise analytical expressions for the SR phase distribution. The present work analyzes the pattern of the SR diffraction occurring on the entrance aperture of a diagnostic device. The SR diffraction pattern is focused onto some screen by an lens. It follows from the theory that the measurement resolution improves with the increase in the transverse size of the lens aperture until saturation. Thus, the obtained theoretical results facilitate to take into account, adequately, the wave properties of SR in physical research and SR diagnostics.