Accurate and Efficient Computation of Synchrotron Radiation in the Near Field Region,
O. CHUBAR, P. ELLEAUME, ESRF - A computer code called Synchrotron Radiation Workshop (SRW) is
presented. It computes the synchrotron radiation from electrons precisely and efficiently in the near and far field
range based on the scalar diffraction theory of Helmoltz-Kirchoff. The codes accept an arbitrary magnetic field
description which includes undulators, wigglers, bending magnet (central and edge), quadrupole, etc. The
polarization, spatial and angular intensity and phase are accurately computed for a filament or thick electron beam
from the millimetre range (1 meV) to the very hard X-rays (1 MeV). For long wavelength, an efficient wavefront
type of propagation is implemented using Fourier Optics which handles any number of drift space, rectangular
diffracting aperture, lens or focusing mirror. Among other things, SRW is useful to design electron beam diagnostics
for an synchrotron source such as electron emittance diagnostic from bending magnet centre or edge radiation or
beam position monitoring in quadrupole using the visible or infra-red radiation. The code operates on PowerMac and
Windows95/NT under the Igor Pro package. It is driven by command line and/or dialog box with on line help.