

Report Undulator Parameters Maths

Synchrotron Radiation parameters from undulator light source

1.0 - SIRUS Storage Ring Specification Parameters

Electron Energy	3.0	Average Current (A)	0.1
Circumference (m)	518.396	Bunches	864.0
Bunch length (mm)	2.5	Nat. Emittance (m.rad)	2.50e-10
Coupling Constant	0.01	Energy Spread	8.30e-04
Beta x (m)	1.357	Beta y (m)	1.6
Eta x (m)	0.0	Eta y (m)	0.0

2.0 - Storage Ring Parameters Calculation

Relative Energy (eV)	5870.841487279843	Emission angle (rad)	1.70e-04
Emittance horizontal x (m.rad)	2.50e-10	Emittance vertical y (m.rad)	2.50e-12
Source Size x (m)	1.84e-05	Source Size y (m)	2.00e-06
Source divergence x (rad)	1.36e-05	Source divergence y (rad)	1.25e-06

3.0 - Undulator Input Parameters

Gap value (mm)	13.6	Magnetic field (T)	1.2
Periodic length (mm)	52.5	Device length (m)	2.4

4.0 - Undulator Radiation Output (theta=0)

Deflection parameter K	5.884e+00	Undulator source size n=1 m	1.456e-05
Wavelength 1st (theta=0)	1.395e-08	Undulator source divergence n=1	7.623e-05
Photon energy of 1st (keV)	8.894e-02	Photon beam sizes x, n=1 (m)	2.353e-05
Total Pwr radiated (kW)	6.891e+00	Photon beam sizes y, n=1 (m)	1.470e-05
Ang. radiation pwr (W/mrad ²)	3.912e+04	Photon beam divergence x, n=1 (m)	7.744e-05
Ang. Spec Flux (ph/s/mrad ² /0.1%BW)	6.062e+16	Photon beam divergence y, n=1 (m)	7.624e-05
Photon Flux 1st (ph/s/0.1%)	2.212e+15	Brightness 1st (ph/s/mrad ² /mm ² /0.1%BW)	2.744e+19

