

## Parameters of the Solaris source: bending magnet and centre of straight section.

### 1. Bending magnet

**Table 1. The characteristics of the radiation source located at the centre of the bending magnet**

Electron energy	Energy of the electron beam	1.5 GeV
Average current	Average current of the electron beam	500 mA
Circumference	Circumference of the storage ring	96 m
Bunches	Number of bunches	32
$\sigma_z$	Bunch length (rms)	60 mm
Natural emittance	Natural emittance of the electron beam	5.982e-9 m*rad
Coupling constant	Coupling constant of the electron beam= vertical emittance/horizontal emittance	0.01
Energy spread	Energy spread of the electron beam (rms)	0.000745
$\beta_x, \beta_y$	Betatron function (at the centre of the source)	0.220 m, 15.78m
$\alpha_x, \alpha_y$	Lattice function to denote the slope of the phase ellipse of the electron beam (at the centre of the source)	0.2691, -1.1923
$\eta_x, \eta_y, \eta_x', \eta_y'$	Dispersion function (at the centre of the source)	0.0337 m, 0.0 m, 0.138 rad, 0.0 rad

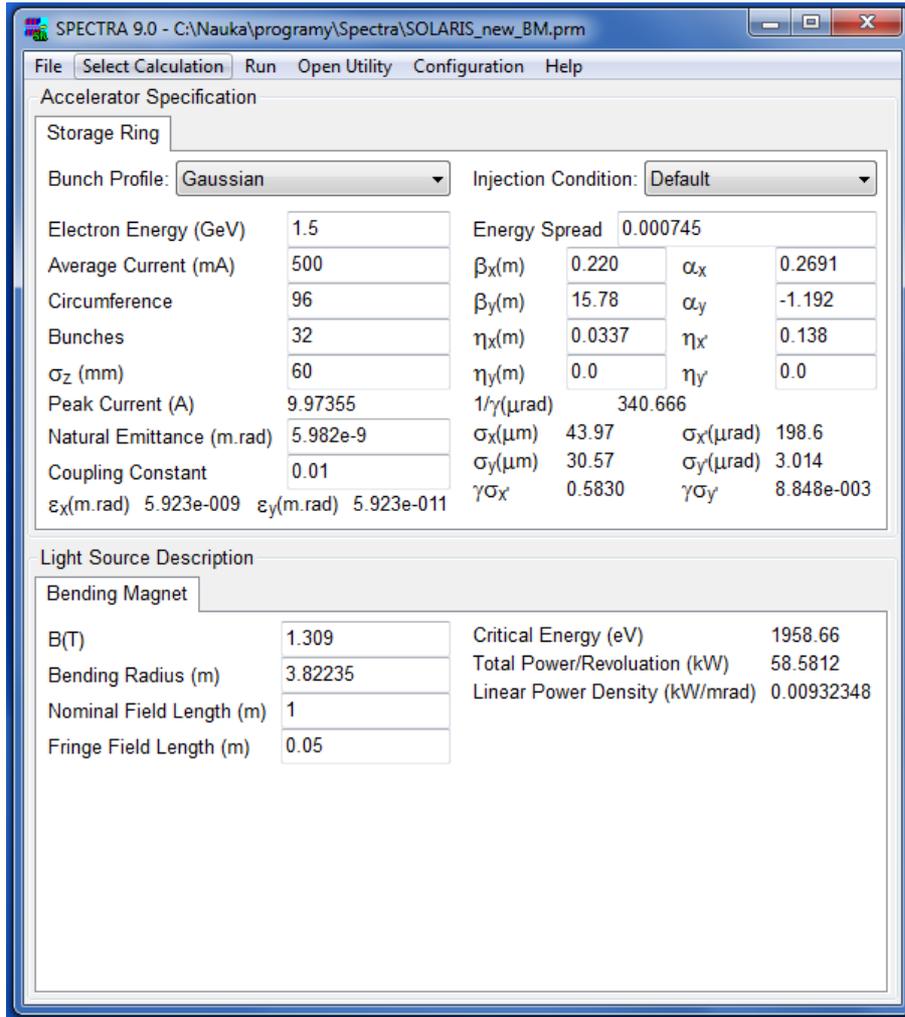
**Table 2. Parameters of the bending magnet**

B	Magnetic field	1.309 T
Radius		3.82235 m
Fringe Field length		0.05 m

**Table 3. Parameters of the bending magnet source (critical energy= 1959 eV)**

Electron beam size:		
$\sigma_x$	Electron horizontal beam size	44.0 $\mu\text{m}$
$\sigma_y$	Electron vertical beam size	30.6 $\mu\text{m}$
Electron beam divergence:		
$\sigma_x'$	Horizontal electron beam divergence	198.6 $\mu\text{rad}$
$\sigma_y'$	Vertical electron beam divergence	3.014 $\mu\text{rad}$

Figure 1. The bending magnet source parameters calculated using SPECTRA software.



## 2. The centre of the straight section

**Table 4. Parameters of the Storage ring**

Electron energy	Energy of the electron beam	1.5 GeV
Average current	Average current of the electron beam	500 mA
Circumference	Circumference of the storage ring	96 m
Bunches	Number of bunches	32
$\sigma_z$	Bunch length (rms)	60 mm
Natural emittance	Natural emittance of the electron beam	5.895e-9 m*rad
Coupling constant	Coupling constant of the electron beam= vertical emittance/horizontal emittance	0.01
Energy spread	Energy spread of the electron beam (rms)	0.000745
$\beta_x, \beta_y$	Betatron function (at the centre of the source)	5.707m, 1.638 m
$\alpha_x, \alpha_y$	Lattice function to denote the slope of the phase ellipse of the electron beam (at the centre of the source)	0.0, 0.0
$\eta_x, \eta_y, \eta_x', \eta_y'$	Dispersion function (at the centre of the source)	-0.0016 m, 0.0 m, 0.0 rad, 0.0 rad

**Table 5. Parameters of the electron beam at the centre of the straight section**

Electron beam size:		
$\sigma_x$	Electron horizontal beam size	182.5 $\mu\text{m}$
$\sigma_y$	Electron vertical beam size	9.78 $\mu\text{m}$
Electron beam divergence:		
$\sigma_x'$	Horizontal electron beam divergence	32.0 $\mu\text{rad}$
$\sigma_y'$	Vertical electron beam divergence	5.969 $\mu\text{rad}$