

XOP Power calculations at 11 keV

Eric Dufresne,
June 28, 2016

2 UA at 11 keV, pinhole and mirror aperture

Accept Cancel Help

Title Two APS Undulator A, Beam Parameters on April 11, 2014 4h25pm

Machine Parameters

Energy (GeV)	Current (mA)
7.00	100.00

Beam Parameters

Sigx (mm)	Sigy (mm)	Sigx1 (mrad)	Sigy1 (mrad)
0.278	0.011	0.0118	0.0036

Undulator Parameters

Period length (cm)	Number of periods	Deflection parameter Kx	Deflection parameter Ky
3.30	144	0.000	0.745

Scan Parameters

Minimum energy (eV)	Maximum energy (eV)	Number of energy-points
4000.0	36000.0	3000

Pinhole Parameters

Distance (m)	X-center of pinhole (mm)	X-size of pinhole (mm)	X number of points
29.100	0.000	0.275	10
	Y-center of pinhole (mm)	Y-size of pinhole (mm)	Y number of points
	0.000	0.302	10

Mode

- Angular/spatial flux density distribution
- Angular/spatial flux density spectrum
- On-axis brilliance spectrum
- Flux spectrum through a pinhole
- Flux spectrum integrated over all angles
- Power density and integrated power

Method

- Non-zero emittance; finite-N
- Zero emittance; finite-N
- Non-zero emittance; infinite-N/conv.

Harmonic Number

- All harmonics
- Lowest order harmonic
- Harmonic # 1
- Edit harmonic number

Xpower input parameters

Accept Cancel Help

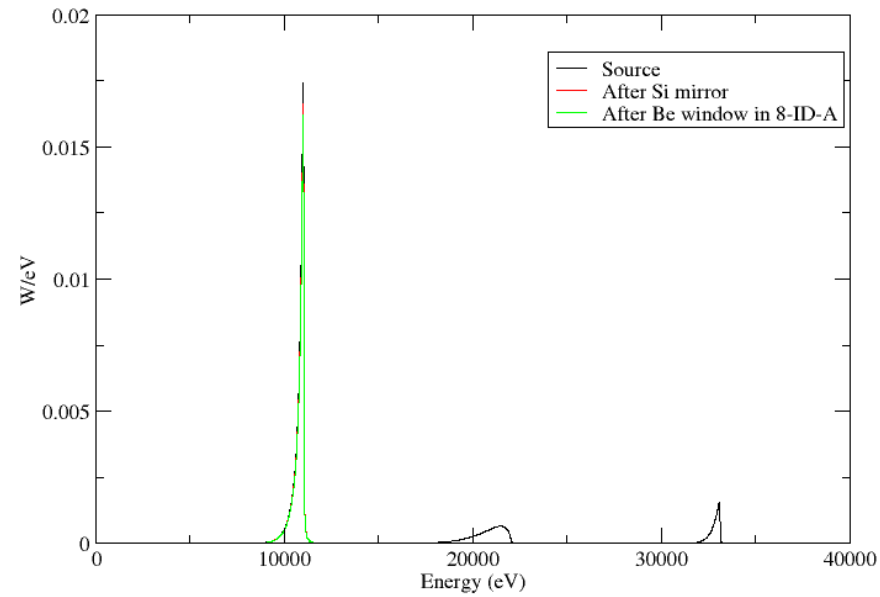
XPOWER

f1f2 dataset: f1f2_Windt.dat	Mu dataset: CrossSec_XCOM.dat	Source: xop/source Power (file: SRCOMPW)
---------------------------------	----------------------------------	---

Number of elements:
2

1st oe formula Si	kind: Mirror	Mirror angle[mrad] 2.500000	Roughness[Å] 1.000000	Density [g/cm ³] ?
2nd oe formula Be	kind: Filter	Filter thick[mm] 0.2540001		Density [g/cm ³] ?

Spectral power of source and after each optics



Power after each elements

Source energy (start,end,points): 4000.00, 36000.0, 3001
Number of optical elements: 2
Incoming power [source integral]: 6.98485
Normalized Incoming power: 1.00000

***** oe 1 [Mirror] *****

Material: Si

Density [g/cm³]: 2.3300000

grazing angle [mrad]: 2.50000

roughness [A]: 1.00000

Outcoming power: 4.87333 (total is 6.985 W)

Absorbed power: 2.11152

Normalized Outcoming power: 0.697701

***** oe 2 [Filter] *****

Material: Be

Density [g/cm³]: 1.8500000

thickness [mm] : 0.254000

Outcoming power: 4.74883 (to split between E and I hutches)

Absorbed power: 0.124499

Normalized Outcoming power: 0.679876

Absorbed dose Gy.(mm² beam cross section)/s: 264948.54

How does this compare to closed gap at 7.35 keV?

Source energy (start,end,points): 4000.00, 24000.0, 2001

Number of optical elements: 3

Incoming power [source integral]: 8.63734

Normalized Incoming power: 1.00000

***** oe 1 [Mirror] *****

Material: Si

Density [g/cm³]: 2.3300000

grazing angle [mrad]: 2.50000

roughness [Å]: 1.00000

Outcoming power: 4.54278 (total is 8.367 W)

Absorbed power: 4.09457

Normalized Outcoming power: 0.525946

***** oe 2 [Filter] *****

Material: Be

Density [g/cm³]: 1.8500000

thickness [mm] : 0.254000

Outcoming power: 4.25298 (to share between I and E hutches)

Absorbed power: 0.289795

Normalized Outcoming power: 0.492395

Absorbed dose Gy.(mm² beam cross section)/s: 616716.14