

**NAME**

`pabopto2xyz` - convert a collection of single-channel BSDF measurements to CIE-XYZ colorimetry

**SYNOPSIS**

```
pabopto2xyz [ -m X1 X2 X3 Y1 Y2 Y3 Z1 Z2 Z3 ] [ -o basename ] [ -n nprocs ] s1files.txt s2files.txt s3files.txt
```

**DESCRIPTION**

*Pabopto2xyz* takes three sets of standard single-channel BSDF files, each measured with a different light source and/or sensor filter to select different wavelengths, combining them into an equivalent set of 3-channel BSDF data files with CIE-XYZ colorimetry. The 3x3 transform from the input file measurements to CIE XYZ color space is set by the `-m` option. The default coefficients correspond to a specific set of filters in use at LBNL, and are probably not applicable to any other instrument.

The `-o` option is used to set the base output file name, which defaults to "pabopto\_xyz". To this base name, the theta and phi angles are added, along with a ".txt" suffix.

The `-n` option may be supplied on Unix systems for multiple processes to speed up the conversion.

The BSDF measurement file names are listed the three required input text files, delineated in each by white space. File names or paths therein cannot contain white space, and quoting/escaping is not supported. The same incident directions must be provided in all three measurement sets, but may be broken into different files. (I.e., two or more BSDF files may correspond to the same incident direction.) Only one file will be produced for each incident direction in the output.

*Pabopto2xyz* works by resampling the second and third input channels to correspond to the exiting directions measured in the first channel. A 2-D interpolant is applied at each incident direction for channels 2 and 3, the given 3x3 matrix is applied, and a combined virtual measurement is produced in output files beginning with the given base name.

The combined data files produced by *pabopto2xyz* are subsequently passed to *pabopto2bsdf(1)* to produce a Scattering Interpolant Representation (SIR) file for further processing.

**EXAMPLE**

To combine three sets of measurements in a REC709 color space and produce a CIE-XYZ file for *pabopto2bsdf*, which produces a color SIR file:

```
pabopto2xyz -m .412 .358 .180 .213 .715 .072 .019 .119 .951 -o blinds_xyz filesR.txt filesG.txt filesB.txt
pabopto2bsdf blinds_xyz*.txt > blinds_xyz.sir
```

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**SEE ALSO**

*bsdf2klems(1)*, *bsdf2rad(1)*, *bsdf2ttree(1)*, *bsdfview(1)*, *genBSDF(1)*, *pabopto2bsdf(1)*