

## section

<b>keys:</b>	<b>[from]</b>	<number>	source picture
	<b>[to]</b>	<number>	output picture
	<b>position</b>	<x>, <y>	coordinates of centre of averaged circle or sector
	<b>angle</b>	<number>	central direction of averaged sector, in radians anti-clockwise from the positive x axis
	<b>width</b>	<number>	angular width of averaged sector, in radians
	<b>mark</b>	<number> <yes> or <no>	mark the section centre line and angular limits on the display

Use **section** to extract radial sections from pictures, optionally averaged over a specified sector or a whole picture, in the form of a 1-D picture.

### Examples

```
ps 50; section to 51; display
```

This command displays the rotationally averaged power spectrum of picture 50.

```
section 21 position 10,20 angle pi/2 width 0.4
```

This command replaces picture 21 with an averaged radial section over a vertical sector of angular width 0.4 radians, radiating from the point 10,20.

```
section angle theta width 0
```

This command produces an interpolated linear section radiating from the origin in the indicated direction.

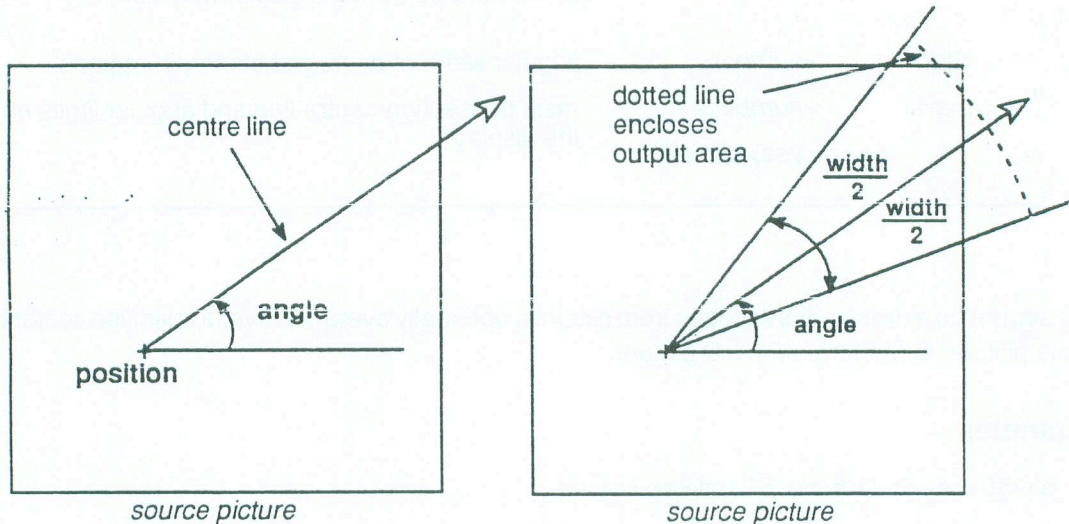
### Description

By default, **section** averages the picture over the right-hand half of the picture. You can restrict the average to a sector only by quoting a sector **width** (in radians) and central **angle** (the anti-clockwise direction from the *positive* x axis, in radians). If you specify a display using the **mark** key, **section** marks the section centre line and angular limits on the display. Refer to *Appendix C, Semper Keys and Options* for details of the **mark** key.

The averaged sections radiate from the picture origin, or from any other **position** within the picture that you specify. The output picture is 1-D, with the origin at the left. Semper determines the size of the output picture so that it spans all source pixels that fall within the specified sector.

## section

**section** works by extracting an initial section by bilinear interpolation along the centre line. It then averages any pixels falling within the specified sector with this section, the contribution of each being shared between two section pixels appropriately. If you specify **width 0**, **section** outputs only those values obtained by interpolating along the centre line (linear section). The diagram below illustrates the **section** command:



### Notes

display marking:	averaged sector
multi-layer pictures:	faulted
forms used internally:	complex

### Defaults and Ranges

keys/options	defaults	range
[from]	current picture, held in the variable <i>select</i>	valid picture number
[to]	source picture	valid picture number
<b>position</b>	position 0,0	within bounds of picture (integers)
<b>angle</b>	angle 0	real number in range 0 to $2\pi$
<b>width</b>	$\pi$	real number
<b>mark</b>	mark off	see <i>Appendix C</i>