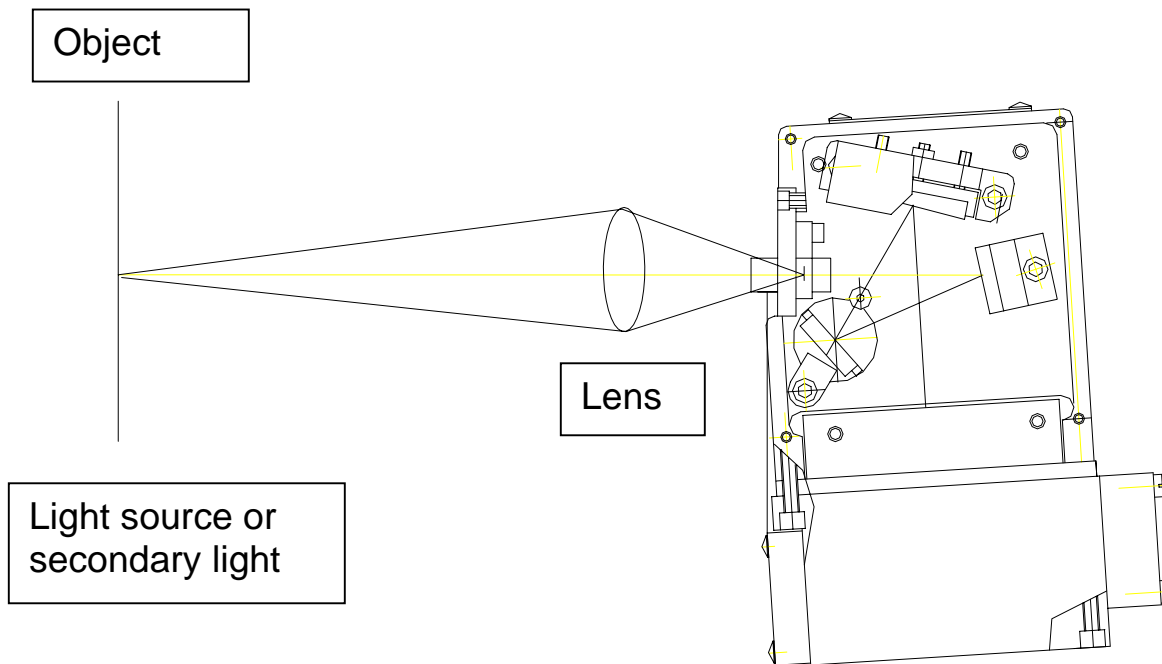


Application Note

Our customer buys a spectrometer and tries to configure it to an instrument, which can measure color, spectral luminance or illuminance. This note is to help customer to have right setup and better understand inside of the instrument to avoid confusing.

Application one: Spot spectroradiometer or Spectrophotometer

To Measure brightness of a light source



What are we measuring

Luminance (photometric brightness) within spot
 (how many photons from that area)
 Or W/mm^2 without Photopic correction
 nit

Measuring unit

Measuring area size (horizontally)

Measuring area size (vertically)

Conjugation size of slit width at object plane

Conjugation size of detector array height

If fiber is used:

Measuring area size

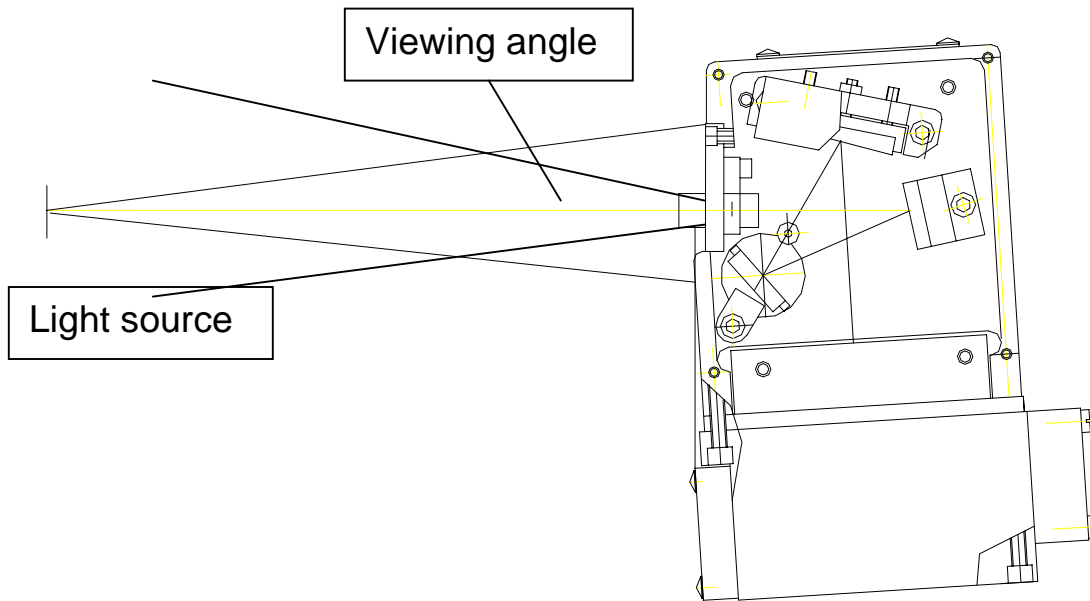
Conjugation size of end of fiber cable at object plane

Note 1: due to high aspect ratio of detector height over slit width, the measuring area will have high aspect ratio too unless cylindrical system is used.

Application two: Directional spectral Illuminance meter or spectral Irradiance meter
To Measure: How many photons or energy hit an area

Difference between illuminance and irradiance

Irradiance	Energy is represented in watts
Illuminance	Energy is represented in Lumen
What we are measuring	Illuminance or irradiance (how many photons hit that area)
Measuring unit	Lux or FC; watt per square meter



Configuration 1: no optics in front of slit. The system is measuring Lux or watt per square meter contributed by the certain angles, which are accepted by NA of the spectrometers. For example, if NA of spectrometer is 0.15, the acceptance angle is 17.25° . Outside of this angle, the photons will be blocked. So, it is called directional spectral illuminance meter. Also, within viewing angle, the beam should be uniform and light source is had better to cover the whole viewing angle.

Configuration2: An integral sphere is attached to the spectrometer. At this circumstance, spectrometer is measuring photons from a small angle of inside of sphere. The integral sphere is measuring the illuminance by its own NA. Sphere can be a good cosine corrector.

Configuration 3: spectrometer is with a NA 0.22 fiber. Similar to above configuration 1, NA of the fiber becomes the NA of the system after calibration. It is directional because NA 0.22 is corresponding to 25.4° .

Configuration 4: spectrometer has a front optics to expand or reduce the NA. The optics could be diffuser, telescope lens, microscope objective lens, dome lens, fish-eye lens or combinations. Cosine corrector is not necessary, but it is helpful to expand or reduce NA further.