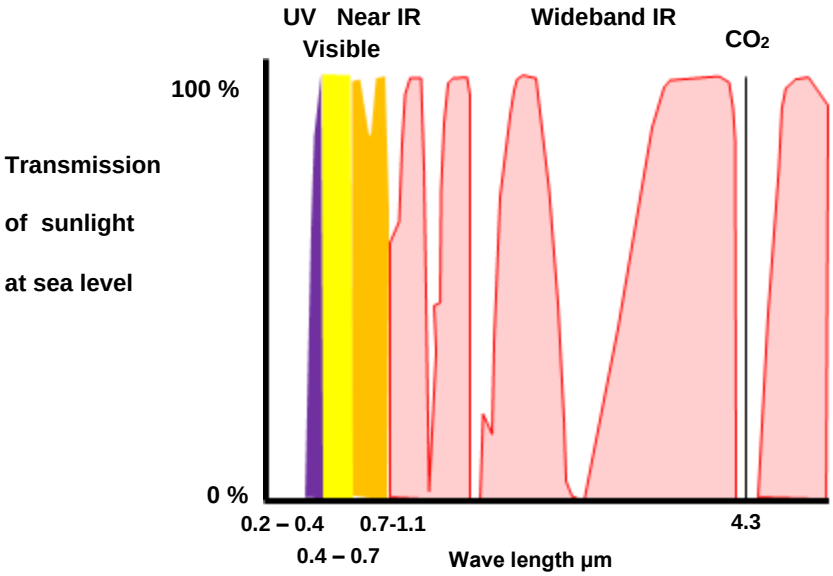
Sunlight transmission



Sunlight transmission.

The sun is a powerful source of energy that also can be very harmful. However, most gases and vapors in the atmosphere such as water (clouds) and Ozone absorb sufficient radiation to protect us. In the picture above you can very well see that the sunlight is filtered around the 4.3 micron. The cold CO_2 in the air absorbs 4.3 micron energy and therefore Infrared flame detectors that use the 4.3 micron are Solar blind. The filter that covers the IR sensor of a flame detector must be very accurate (narrow) because it should not respond to IR radiation over and under 4.4 micron and therefore unfit for outdoor applications.

Between 0.7 and 3 µm a significant fraction of the sunlight is absorbed by the atmosphere. This frequency range is therefore used by some manufacturers for Flame Detection in combination with e.g. UV, Visible or Near IR. The economic advantage is that in this case an expensive Sapphire lens is not needed. It also makes it possible to detect non-Hydrocarbon fires such as burning Hydrogen, Sulfur, Magnesium etc. and still be false alarm resistant.