

1.4: Radiant Intensity, I

Not all bodies radiate isotropically, and a word is needed to describe how much energy is radiated in different directions. One can imagine, for example, that a rapidly-rotating star might be nonspherical in shape, and will not radiate isotropically. The *intensity* of a source towards a particular direction specified by spherical coordinates (θ, ϕ) is the radiant flux radiated per unit solid angle in that direction. It is expressed in W sr^{-1} , and the standard symbol is I . In astronomical custom, the word "intensity" and the symbol I are commonly used to describe a very different concept, to which we shall return later.

When dealing with *visible* radiation, we use the phrase *luminous* intensity rather than *radiant* intensity, and the unit is a lumen per steradian, or a candela. At one time, the standard of luminous intensity was taken to be that of a candle of defined design, though the present-day candela (which is one of the fundamental units of the SI system of units) has a different and more precise definition, to be described in section 1.12. The candela and the old standard candle are of roughly the same luminous intensity.

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