

## 1.9: Apparent Magnitude

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Although it is not the purpose of this chapter to discuss astronomical magnitude scales in detail, it should be evident that, just as intensity is related to absolute magnitude (both being intrinsic properties of a star, independent of the distance of an observer), so normal flux density is related to apparent magnitude, and they both depend on the distance of observer from star. The relationship is

$$m_2 - m_1 = 2.5 \log(F_1/F_2) \quad (1.9.1)$$

We could in principle set the zero point of the scale by writing

$$m = m_0 - 2.5 \log F \quad (1.9.2)$$

and assigning a numerical value to  $m_0$ , so that there would then be a one-to-one correspondence between normal flux density in  $\text{W m}^{-2}$  and apparent magnitude. If we are dealing with normal flux density **integrated over all wavelengths**, the corresponding magnitude is called the apparent *bolometric* magnitude.

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