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Let's talk terahertz!

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LET'S TALK TERAHERTZ!

The terahertz shares the desirable properties of the nanometer as a unit in teaching optics. Like the nanometer, the terahertz is an SI unit. Like the nanometer, the terahertz conveniently represents visible light to three digits in numbers that fall in the midhundreds. Therefore, for example, a HeNe laser may be said to emit at 633 nm or at 474 THz. The terahertz has other desirable properties that the nanometer lacks. First, the frequency is a more fundamental property of light than the wavelength because the frequency does not change as light traverses different media, whereas the wavelength may. Second, the energy of a photon is directly proportional to its frequency. To use terahertz rather than nanometers is therefore more convenient in dealing with cases involving photon energies such as the photoelectric effect or the hydrogen spectrum because the frequencies may be added or subtracted directly. It is not hard to adapt. For example, the visible spectrum is often taken to span 400–700 nm, corresponding to 749–428 THz, falling in the octave 400–800 THz. Something is gained in using terahertz in preference to nanometers in teaching involving visible light.

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