Environmental Science, Problems Chapter 9

9.1

When working with Doppler laser spectroscopy to determine velocities one can measure the speed of clouds. At one instant a cloud is moving with a velocity of 110 m/s and is illuminated by an argon ion laser with wavlength 514.5308 nm. Calculate the relative Doppler shift given by:

$$\frac{f - f'}{f}$$

Answer: $3.67 \cdot 10^{-7}$

9.2

When working with Doppler laser spectroscopy to determine velocities one can measure the speed of clouds. An argon ion laser with wavelength 514.5308 nm illuminates a cloud and we observe a wavelength shift of 0.0017 nm. Calculate the speed of the cloud.
Answer: 990 m/s