**Answer on Question #69408 -Physics / Other**

A stationary observer notes that the spectral line of $\lambda_0 = 4000$ A emitted by a moving star is shifted by $\Delta\lambda = 100$ A towards the red from its normal position. Calculate the speed of the star along the line of sight. Take the speed of light $c = 3\times10^8$ m/s.

**Solution**

The Doppler effect formula

$$\Delta\lambda = \lambda_0 \frac{v}{c}$$

The speed of the star along the line of sight is

$$v = \frac{\Delta\lambda}{\lambda_0} c = \frac{100}{4000} \times 3\times10^8 = 7.5\times10^6 \ \frac{\text{m}}{\text{s}}.$$

**Answers:** $v = 7.5\times10^6 \ \frac{\text{m}}{\text{s}}$.