

# Diffraction Grating Example

Angular splitting of the Sodium doublet:

Consider the two closely spaced spectral (yellow) lines of sodium (Na),  $\lambda_1 = 589 \text{ nm}$  and  $\lambda_2 = 589.6 \text{ nm}$ . If light from a sodium lamp fully illuminates a diffraction grating with 4000 slits/cm, what is the angular separation of these two lines in the second-order ( $m=2$ ) spectrum?

Hint: First find the slit spacing  $d$  from the number of slits per centimeter.