M E 345

Lecture 38

## Today, we will:

• Review the pdf module: Linear Velocity Measurement and do some example problems

## **Example: Velocity measurement**

**Given**: Doppler radar is used to measure the speed of a baseball as sketched (not to scale). The radar frequency is 12,000 MHz.

**To do**: Calculate the maximum angle  $\theta$  that will yield less than 1% error in measuring the speed of the baseball.

## Solution:



## **Example: Velocity measurement**

**Given:** The LDV system in the M E 325 fluids lab uses a red helium-neon laser with wavelength  $\lambda = 632.8$  nm. The angle between the two beams is  $\alpha = 13.53^{\circ}$ . The system is used in a small water tunnel with a speed range of -1 to 1 m/s.

**To do**: Calculate the maximum expected frequency (in units of kHz) of the LDV output. **Solution**: