

Doppler Effect

Doppler Effect

- When a source and an observer of waves are moving relative to each other, the observed frequency is different from the frequency of the vibrating source.
- If the source approaches the observer, or if the observer approaches the source, the frequency appears to increase.
- If the source goes away from the observer, or if the observer goes away from the source, the frequency appear to decrease.

Doppler Effect and Sound

- Approaching source means more waves are striking the observer so a higher frequency (pitch) is observed.
- Receding source means fewer waves are striking the observer so a lower frequency (pitch) is observed.
- Examples: Train in/out of station

Doppler Effect and light

- Examples: star approaches an observer so its light appears at higher frequency (blue shift).
- Examples: Galaxies are accelerating away from observer so their light appears at lower frequencies (red shift).
- Examples: Police use radar gun (radio waves) to monitor speed of cars and trucks.

Group Activity

- 1. The driver of a car hears the siren of an ambulance that is moving away from her. If the actual frequency of the siren is 2000 Hertz, the frequency heard by her may be ?
- 2. A police officer's radar gun indicates that the frequency of the radar wave reflected from an automobile is less than the frequency emitted by the radar gun. This means that the automobile is moving how?

