**DOPPLER EFFECT**

Summary:

The Doppler Effect is a amazing phenomenon in physics that describes the change in frequency or wavelength of a wave in relation to an observer's motion relative to the source of the wave. This investigatory project dives into the various aspects of the Doppler Effect, exploring its principles, applications, and real-world significance.

Named after the Austrian physicist Christian Doppler, this effect manifests as a shift in the perceived frequency of the waves, leading to alterations in pitch or colour.

The basic principle of the Doppler Effect involves the compression of waves if the source and observer are approaching each other, resulting in a higher frequency (blue shift). Conversely, if they are moving away from each other, the waves are stretched, causing a lower frequency (red shift). This effect is commonly encountered in everyday situations, such as the changing pitch of a siren as an emergency vehicle passes by.

The mathematical expressions for the Doppler Effect vary depending on whether the source, the observer, or both are in motion, and they are crucial for predicting the observed frequency shift. The Doppler Effect finds practical applications in different fields, including astronomy, where it is used to analyze the motion of celestial objects, and in medical imaging, such as ultrasound, for assessing blood flow.

Understanding the Doppler Effect enhances our ability to interpret wave behaviour in dynamic scenarios, contributing to advancements in technology, medicine, and our comprehension of the universe.

Mohit R