

Gravitational Wave Data from LIGO Detectors

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Background

- In Einstein's Theory of General Relativity, Einstein guessed that space is actually flat and that gravity is due to distortions in spacetime
- As a result, there can be ripples in spacetime due to other cosmic events like two black holes merging
- These ripples in spacetime are known as gravitational waves



Motivations

We did this project to create models based on the LIGO data from the Hanford and Livingston detectors. The detectors gather data through the detection of gravitational waves that are generated from black holes merging.



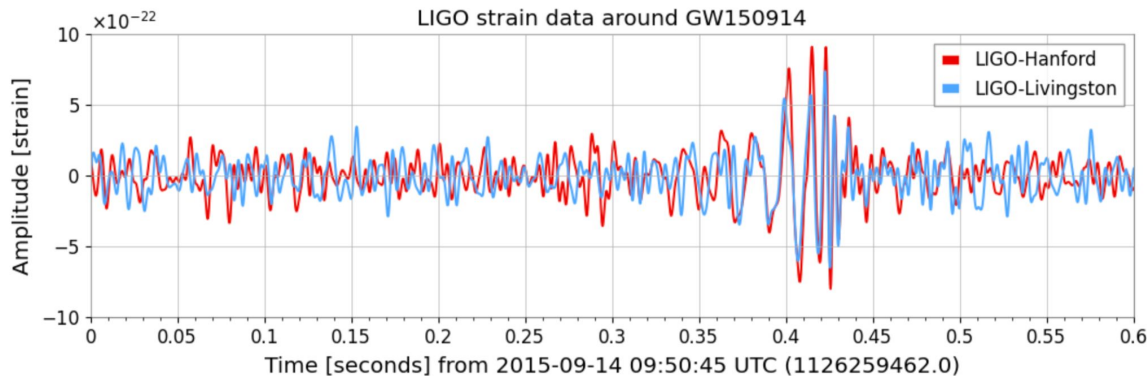
Methods

We used data from the Hanford and Livingston detectors to cross reference the data the detectors gathered, so that way we could make a model that better fits the gravitational wave data. The main method we used to represent this data is graphs, as they work the best to show the behavior of the gravitational waves. The graphs show the frequency of the gravitational waves that are generated. We also made a graph comparing the data from the different detectors.



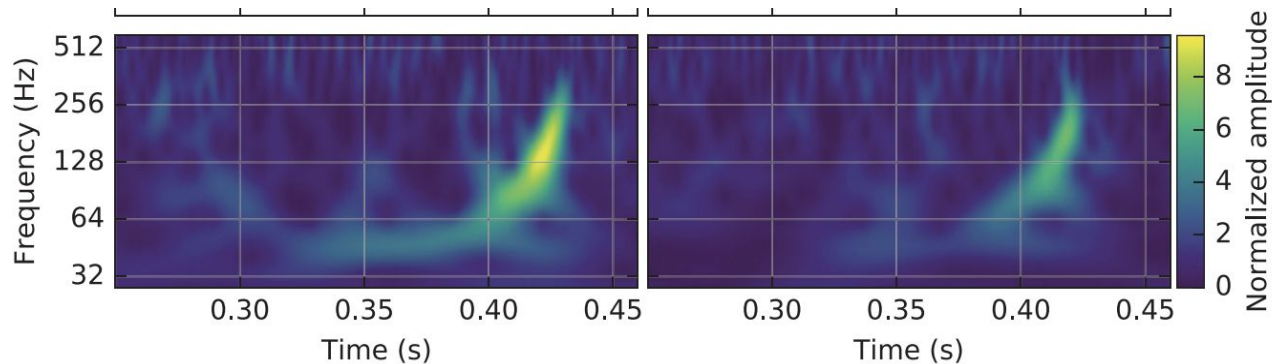
Results

- Though the LIGO detectors are powerful enough to show movements in the lasers from nearly anything close to them, when gravitational waves appear on the LIGO detectors the wavelengths of the lasers look nearly the same as the two detectors are in different locations



Conclusion

- So as a result, based on the data collected from the LIGO detectors in Hanford and Livingston, scientists were able to confirm the existence of gravitational waves



AI Statement

We did not have to utilize AI much for this project.

