The Helium Project
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Objective
- We used a high-altitude ballooning experiment to accurately measure the electromagnetic field in the stratosphere.
- We measured the radio-frequency interference (RFI) in the ultra-long wavelength spectrum at various altitudes.

Theory
- We wanted to see how different altitudes affect low-frequency signals.
- Our payload was comprised of a Raspberry Pi Four microcontroller, a battery, antennas, and sensors.
- We connected our payload to a balloon that would burst at approximately 100,000 ft.
- We predicted our payload would float back down to earth so that we could retrieve and analyze the data.

Methods
- We designed a high-level diagram that consisted of all of the necessary components.
- We secured our BME280, GPS, and Antennas inside our protective box with hot glue.
- We sealed our payload so that our sensors would survive the flight, and the following descent.
- Our phone number was on the box in case a person found our box outside of our GPS range.

Results
- We wanted to complete a Fourier Transform on the data that we received from the antenna to measure amplitude discrepancies at different altitudes.
- During the flight an error happened where our file corrupted which deleted our data.
- Below is a sample graph of what our data would have possibly looked like.

Launch and Retrieval
- We launched the balloon at 10:10am on 04-26-2021.
- We followed a simulated route to Fairfield and prepared for landing.
- Our GPS trackers malfunctioned so we lost communication as soon as we released it.
- We received a call at 1:49pm from Michael at Klein Farms in Stockton informing us our payload had landed in his potato field.

Acknowledgements
- Dr. Mohamed Salem
- David Story
- Ryan Grumich
- Stacey Pelton
- Koret Foundation
- Office of Research