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Salisbury University

**ThinSat Project Proposal**

The goal of the ThinSat project is to demonstrate the capabilities of the Global Navigation Satellite System Reflectometry (GNSS-R) to map and detect rouge waves. The GNSS-R is a passive radar that can generate a map of the surface of the ocean, giving us the information on the height of waves. This information will provide evidence on rouge waves, which we use to understand these waves. For years, rouge waves have been the cause of destruction for many offshore oil sites and ships. With our ThinSats ability to map these rouge waves, it can lead to a better understanding of this phenomena and allow for safety measures to be set in place to prevent future destruction.

This project will be run by eleven Salisbury undergraduates, eight of which are physics majors and three computer science majors. I will be leading the computer science aspects of the ThinSat development, with assistance from my mentor, Giulia Franchi. For our group, computer science, we will be responsible for designing the needed algorithms that allow the ThinSat to run properly and be able to detect rouge waves specifically. As well, our group will be responsible for the circuitry of the ThinSat itself.

With this current pandemic going on now, it is hard to give an exact timeline with launch dates being pushed back for other projects and with Salisbury possibly being online for the Fall 2020 semester. Our groups main goal this summer is to have all our research and development completed before coming back to campus. Our group will be having weekly calls to discuss our findings and develop a plan to develop algorithms for the code and the hardware design of the ThinSat. Upon campus reopening for the Fall 2020 semester, our group will begin implementing our ThinSat design plans and start testing by the end of the semester. Baring no issues, our ThinSat will be launched at the NASA Wallops Flight Facility Center during the Spring 2021 semester.