

# Quadrotor Unmanned Aerial Vehicles as Platforms for Atmospheric Measurements in Marine Environments



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- **Navy's radiosonde (weather balloon) program has been eliminated.**
- **Electronic Maneuver Warfare (EMW) has become a critical concept in the current Navy doctrine.**
- Therefore, there is a critical need for high vertical resolution and accurate measurements of pressure, temperature and humidity because these parameters have large impacts on the systems that are crucial for successful EMW.

- A measurement system consisting of a radiosonde attached to a quadrotor unmanned aerial vehicle (QUAV) was developed and tested for accuracy on land by the PI, using CRUSER support.
- The system will be tested from vessels in a variety of marine environments, including the Monterey Bay, the Arctic Ocean and the Ross Sea (near Antarctica).
- These tests will validate the measurement accuracies in sometimes harsh marine and polar environments.
- Various reusable and self-recording sensor packages will be tested, as will methods for quantifying air pressure, temperature, humidity, and wind speed and direction.

- If such a system became operational, the result would be a significant increase in Battlespace Awareness of the effects of the atmosphere on the range, quality and stealthiness of systems that use electromagnetic radiation such as radar, communications, jamming, electronic surveillance measures and various weapons systems. This gives our forces a tactical advantage over an adversary who does not have this knowledge.
- Even if the Navy does not adopt this system for operational use, its development will have immediate positive impacts on a variety of Navy-related research efforts.