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sUAS-based Remote Sensing of Surface Waves and Breaking using an EO/IR Camera System

Ortiz-Suslow, David

Monterey, California: Naval Postgraduate School

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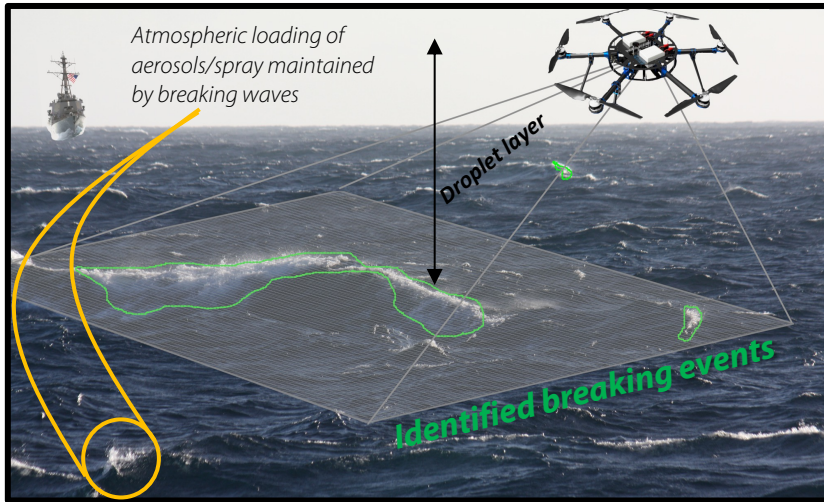
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Idealization of sUAS remote sensing wave breakers at the base of marine aerosol and spray layer under a strong breeze.

Problem Statement

- We are proposing to develop a novel technique for directly measuring surface wave breaking characteristics and statistics from sUAS-based remote sensing.
- Our approach has three major phases: (1) platform integration and flight protocol, (2) field testing, (3) test data analysis and algorithm development.
- Our approach will augment current environmental sensing capabilities from sUAS, providing further utility for these versatile platforms in battlespace characterization.

Impact

- US Navy ships rely on electromagnetic (EM) systems for navigation (e.g., electro-optical (EO) and infrared (IR)), battlespace awareness, and self-defense. Maritime performance depends on atmosphere-ocean interaction.
- EO/IR system performance is significantly degraded by signal attenuation due to scattering from aerosols and sprays generated from surface wave breaking.
- Operational superiority and performance prediction requires fundamental understanding of how natural, marine processes impact EO/IR systems at all scales.

Transition

- The developed technology and capabilities will transition to augmenting the PI's capabilities for basic and applied research in atmosphere-ocean interaction physics as they relate to Naval autonomous systems, battlespace characterization, and EM warfare research.
- The deliverables from this project will contribute directly to NPS graduate student theses.
- Opportunities to leveraging this technology to seek additional reimbursable funding will be actively explored.