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Autonomous, Maritime Infrasound Sensing Capability

Wide infrasound coverage is obtained using fixed, land-based monitoring stations. However, two-thirds of the earthâ□□s surface is composed of oceans, and while some sensing stations are located on islands, no capability yet exists to monitor infrasound from sensors fielded directly in the maritime environment. We investigate the potential of fielding microbarometer sensors on persistent, autonomous, unmanned surface vehicles (USVs), yielding the potential of an expansive, new, remote environment from which infrasound signal detection can be made. To enable such a USV-hosted infrasound sensing capability, numerous unique challenges need to be solved including motion-induced noise, wind noise, water intrusion, and survivability amidst salt water in the harsh maritime environment. A scheme for reducing interference signals due to heave motion has been developed and tested utilizing an auxiliary IMU in conjunction with an adaptive filter. Recent work has focused on the development of a unique, compact wind reduction approach using closed-cell foam that also protects the sensor from water intrusion. Following development and testing of a single platform, a small fleet of vehicles and sensors will be developed and deployed enabling the configuration of a sensor array in order to improve detection capability and provide directionality information.

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