Coral Mapping with UAVs and Fluid Lensing
by
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Fluid Lensing is a hypothetical model developed for fluid-optical interactions that can remove strong optical distortions along the line of sight and even enhance the angular resolution of an otherwise underpowered optical system. Recently, we demonstrated the applicability of Fluid Lensing on a quadcopter-based UAV aerial platform to create the first map of a coral reef system with centimeter-level precision in 3D. Preliminary results from a mapping effort in American Samoa show the technique is effective in removing large optical distortions from surface waves observed by high-frame-rate video data acquired from our UAV platform. Corrections were significant enough to enable accurate 3D reconstruction, verified with underwater ground control points and mapping surveys.