

## Wireless High Speed Underwater Vector Communication

Over 75% of the earth's surface is covered with water that overlays many resources upon which our lives depend. High speed wireless underwater data communication between underwater sensors, deepwater moored instruments, autonomous underwater vehicles, and surface vessels is of crucial importance in many applications of national interest. However, the achievable data rates by the conventional technologies are much smaller than what is needed for effective communication and management. To have high speed communication links in underwater environments, we proposed and developed the concept of communication via the vector components of the acoustic field.

This research of the aCASP Lab ranges from channel modeling to transceiver design and devising proper signaling schemes, as well as prototype modem development. Channel modeling research aims at understanding and characterization of acoustic particle velocity channels as new pipelines for data communication. Transceiver design research intends to devise new communication and signal processing solutions that are optimized for such channels.