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MEMS Direction Finding Acoustic Sensor

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Monterey, California: Naval Postgraduate School

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MEMS Direction Finding Acoustic Sensor



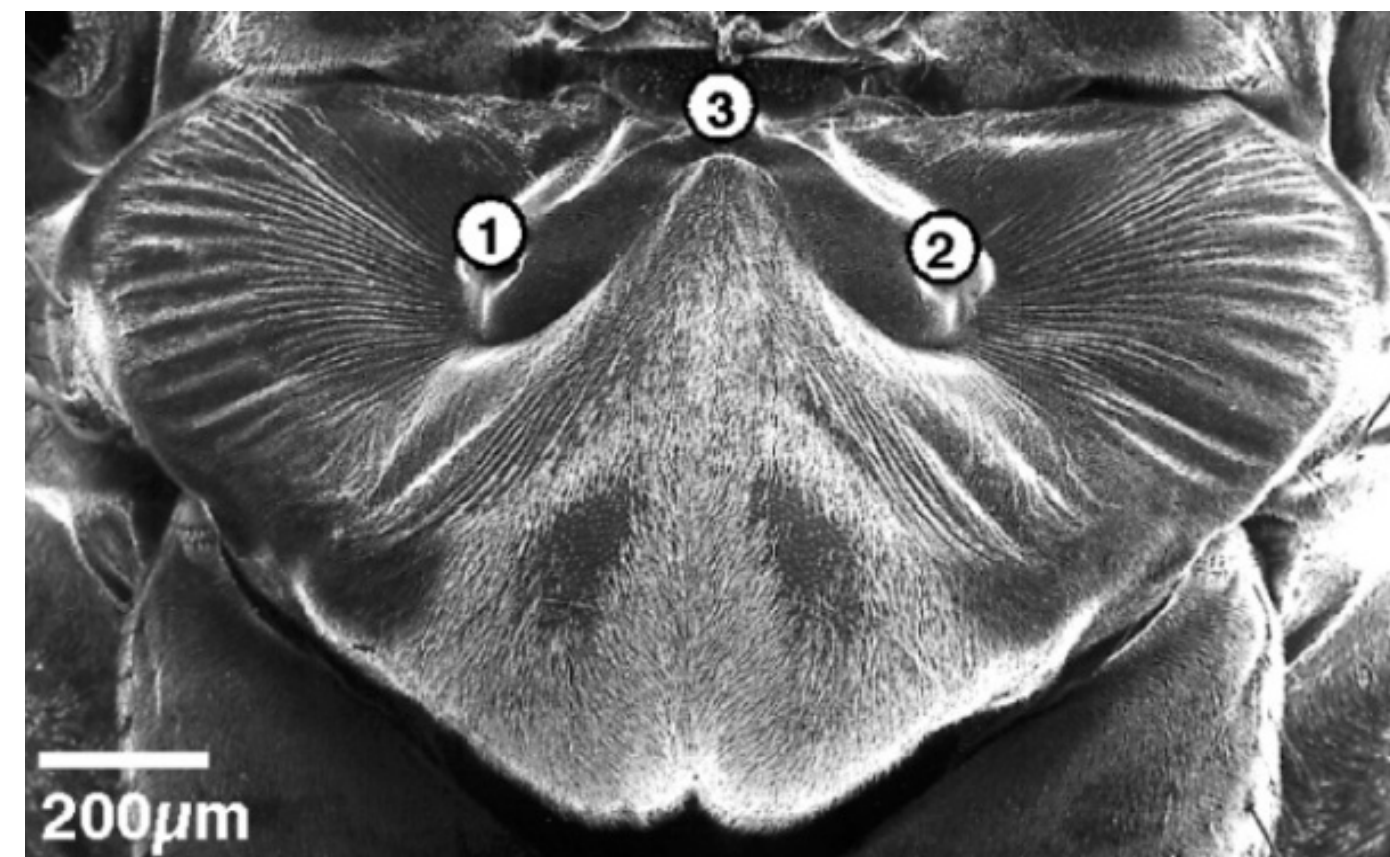
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Objective

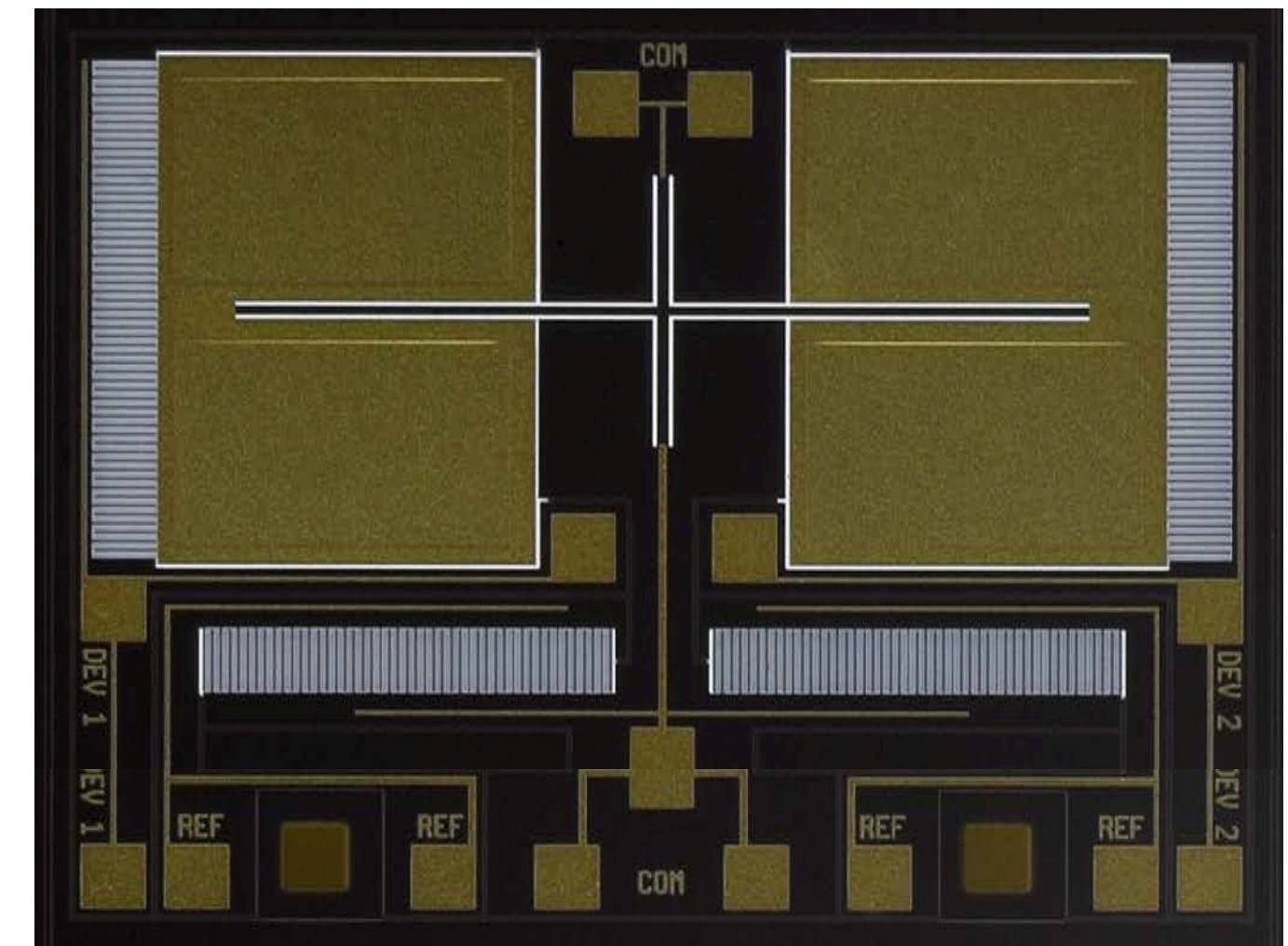
Develop a miniature directional acoustic sensor to locate bearing of sound sources in air and underwater.

Ormia flies locate crickets by listening to their chirps using highly sensitive directional sensing ears.

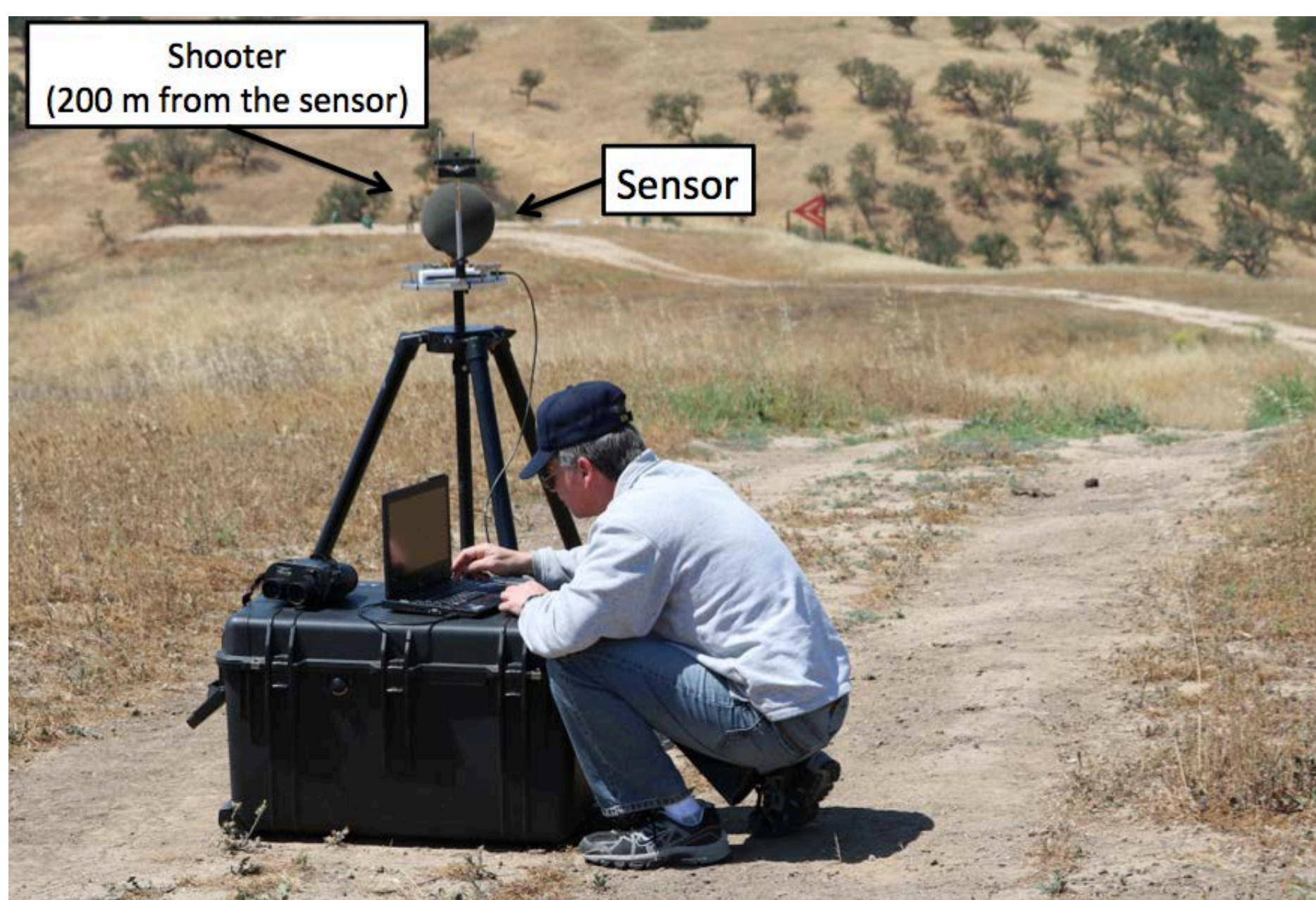
Image of Fly's Coupled Ear Drums



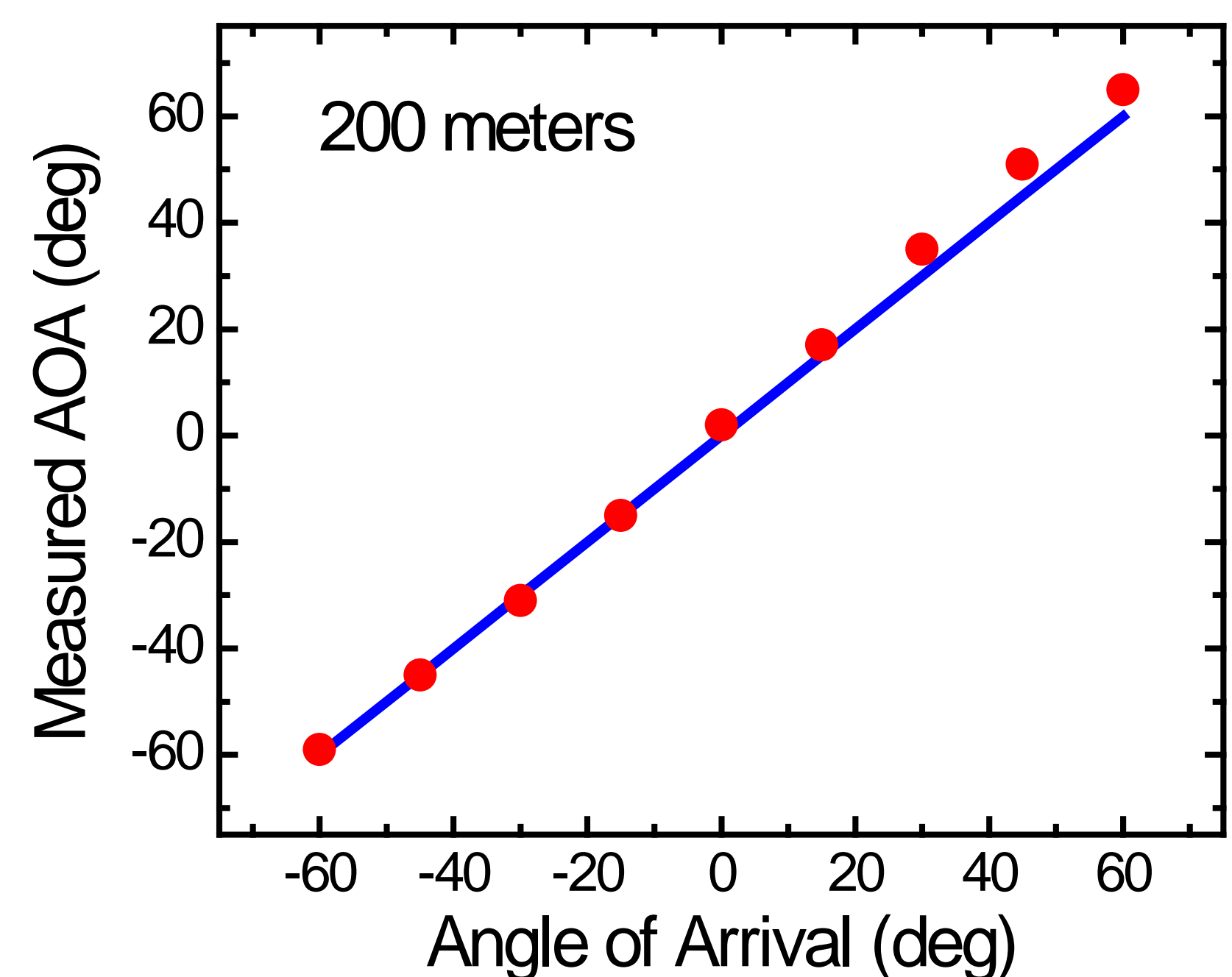
Fabricated MEMS Acoustic Sensor



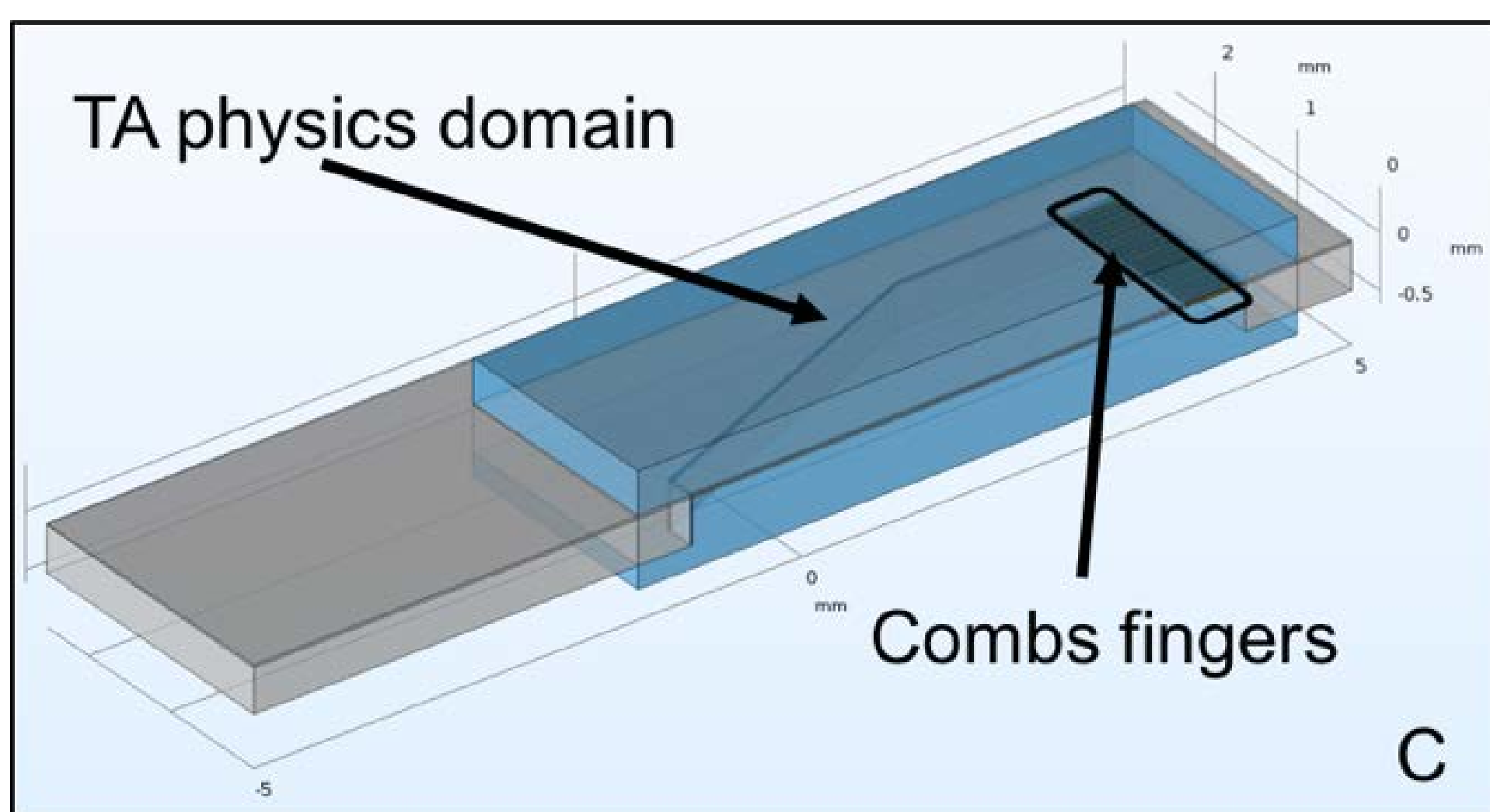
Field Testing At Camp Roberts



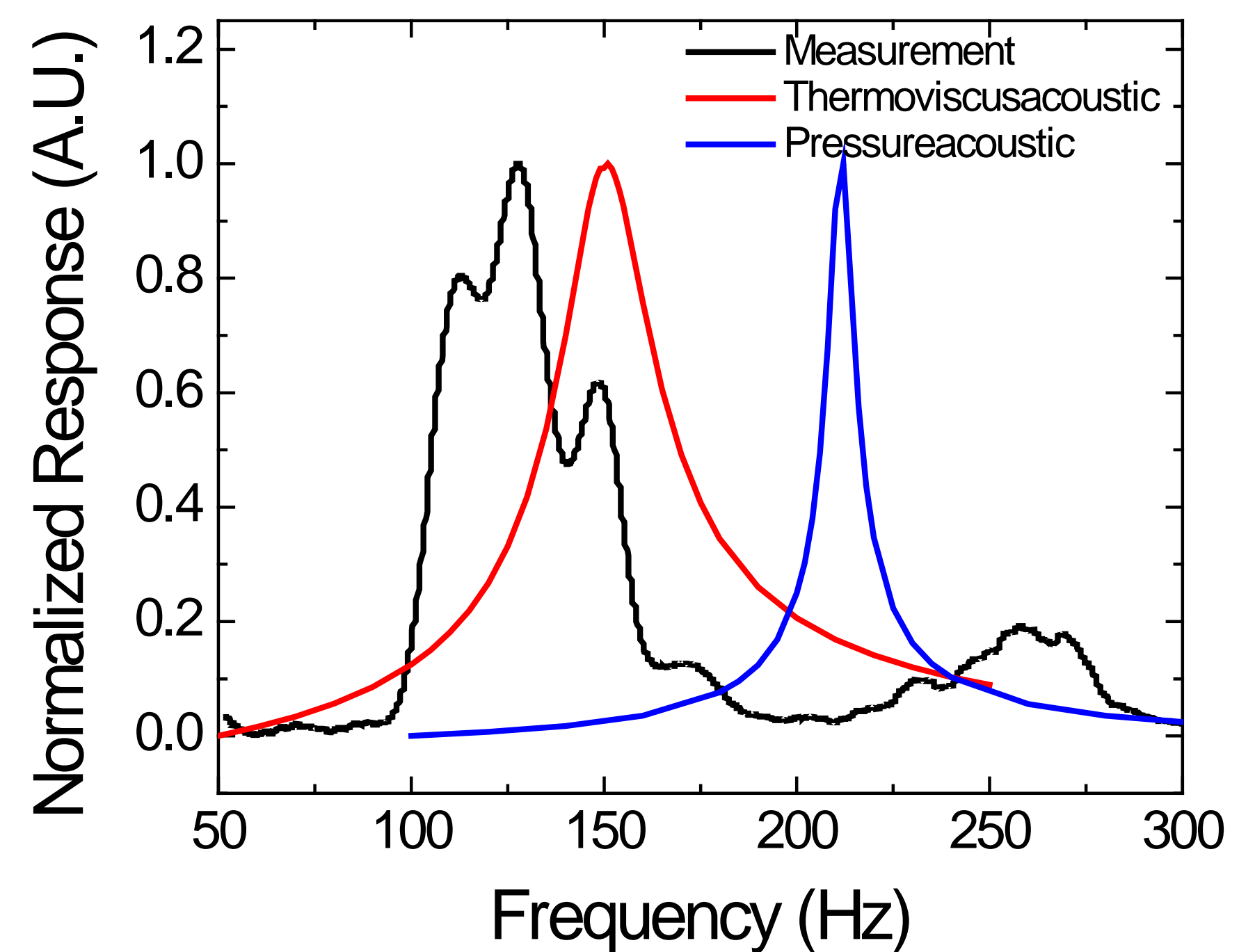
Measured vs. Actual Bearing



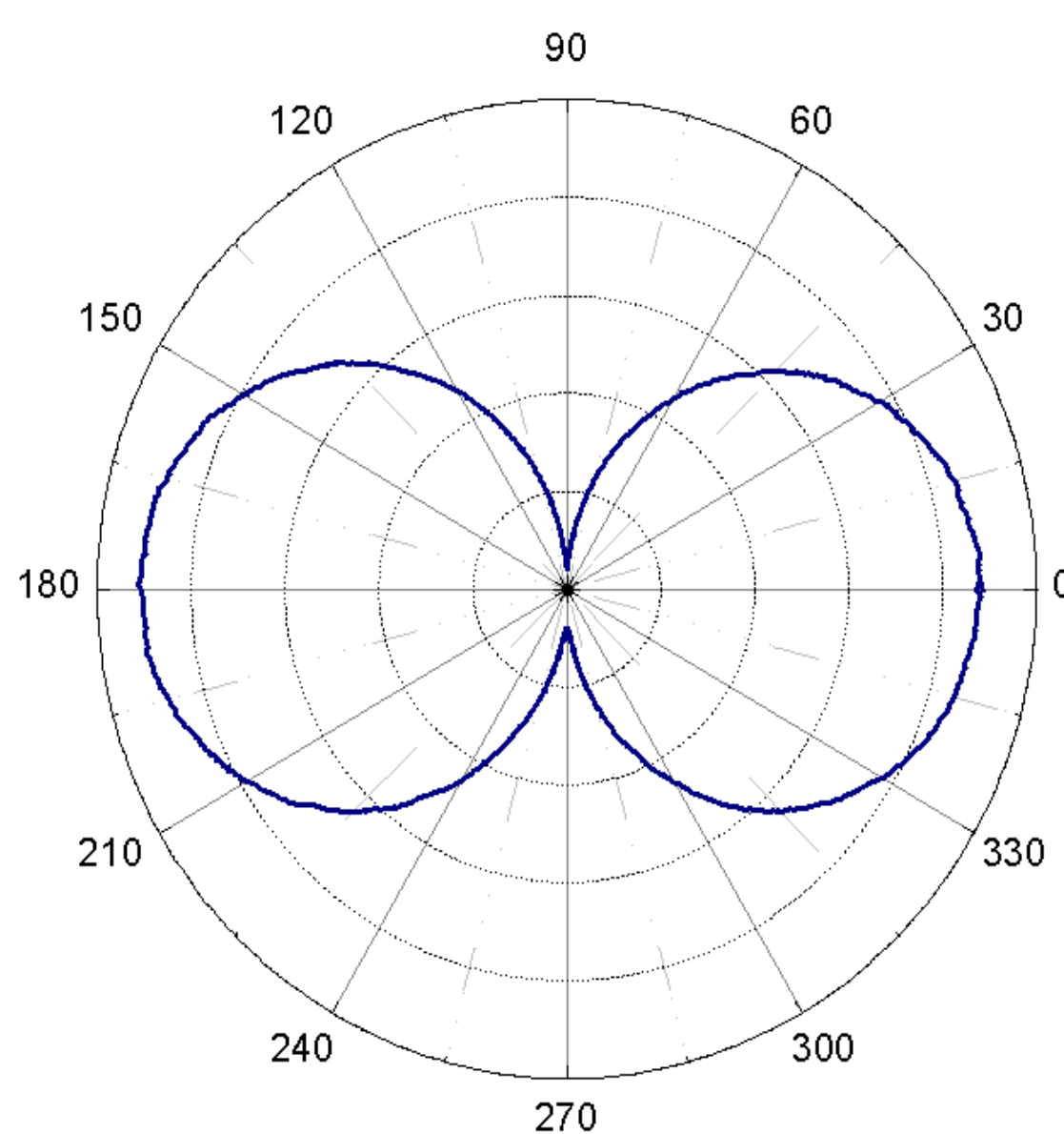
Underwater sensor design



Measured and Simulated Responses



Underwater Directional Response



Findings

Sensors operating in air had sensitivity of about 10 V/Pa. Bearing of sound air was determined within two degrees. Successfully designed sensors to operate in underwater. Excellent directional sensitivity was observed in underwater.

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Graduate School of Engineering and Applied Sciences, Physics Department

Topic Sponsor: Office of Naval Research (ONR)

NRP Project ID:
NPS-18-N084-A

