Optical Fiber Infrasound Arrays at Camp Elliott, UCSD

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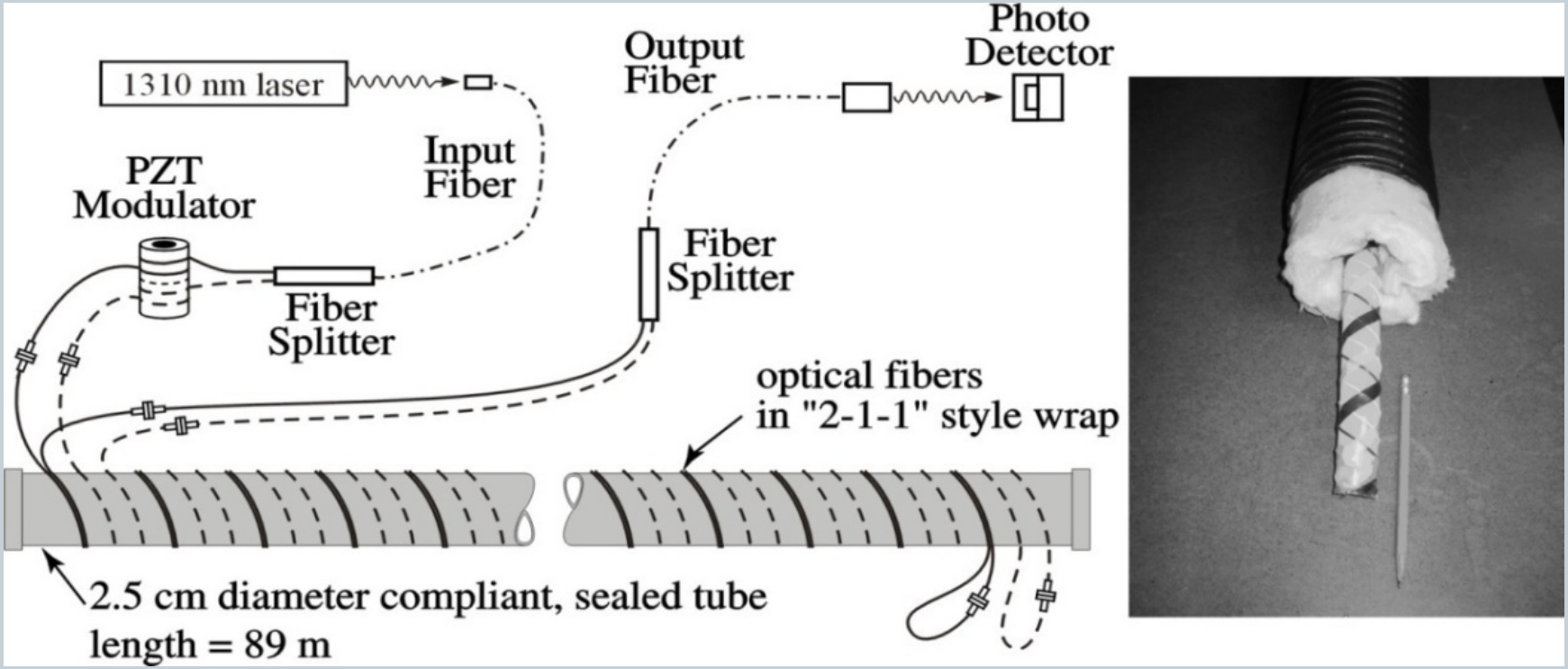
Motivation and Objectives

- OFIS – develop a better infrasound sensor
  - Wind noise reduction
  - Record infrasound signals better under all conditions
  - Make the most compact array possible
- Short-term objectives
  - Develop a “passive acoustic radar” array to test new algorithms for signal direction finding.
  - Develop an infrasound calibrator.
- PFO is a long drive
  - Development at Elliott much easier
  - Lots of planes near Elliott that emit infrasound.
  - Lots of space at Elliott for calibrator testing at various ranges.

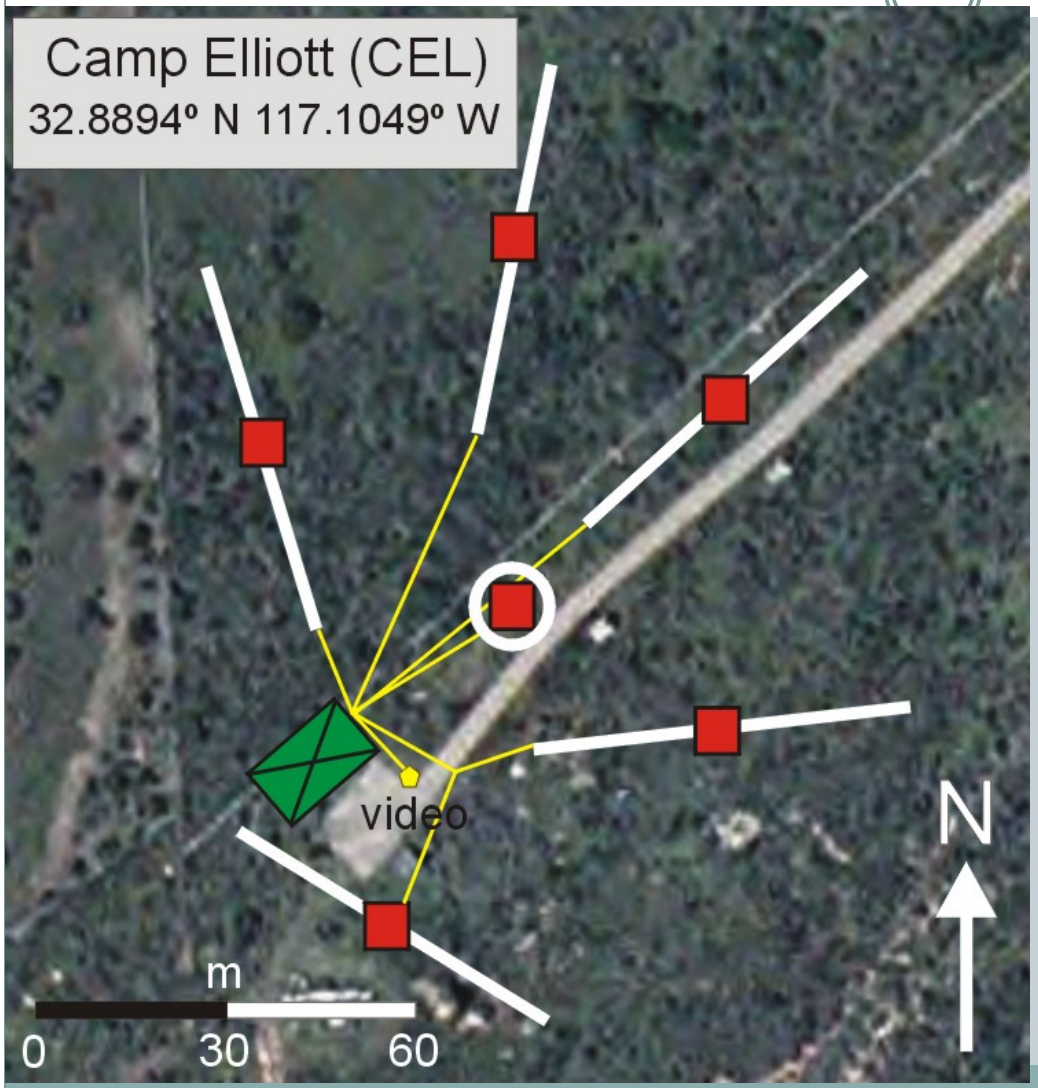
What is an OFIS – Optical Fiber Infrasound Sensor

OFIS is a Directional Microphone
(similar to satellite dish)

Laser Interferometry Base: Low self noise, high dynamic range (real*64)



Elliott OFIS array



“Passive Acoustic Radar”

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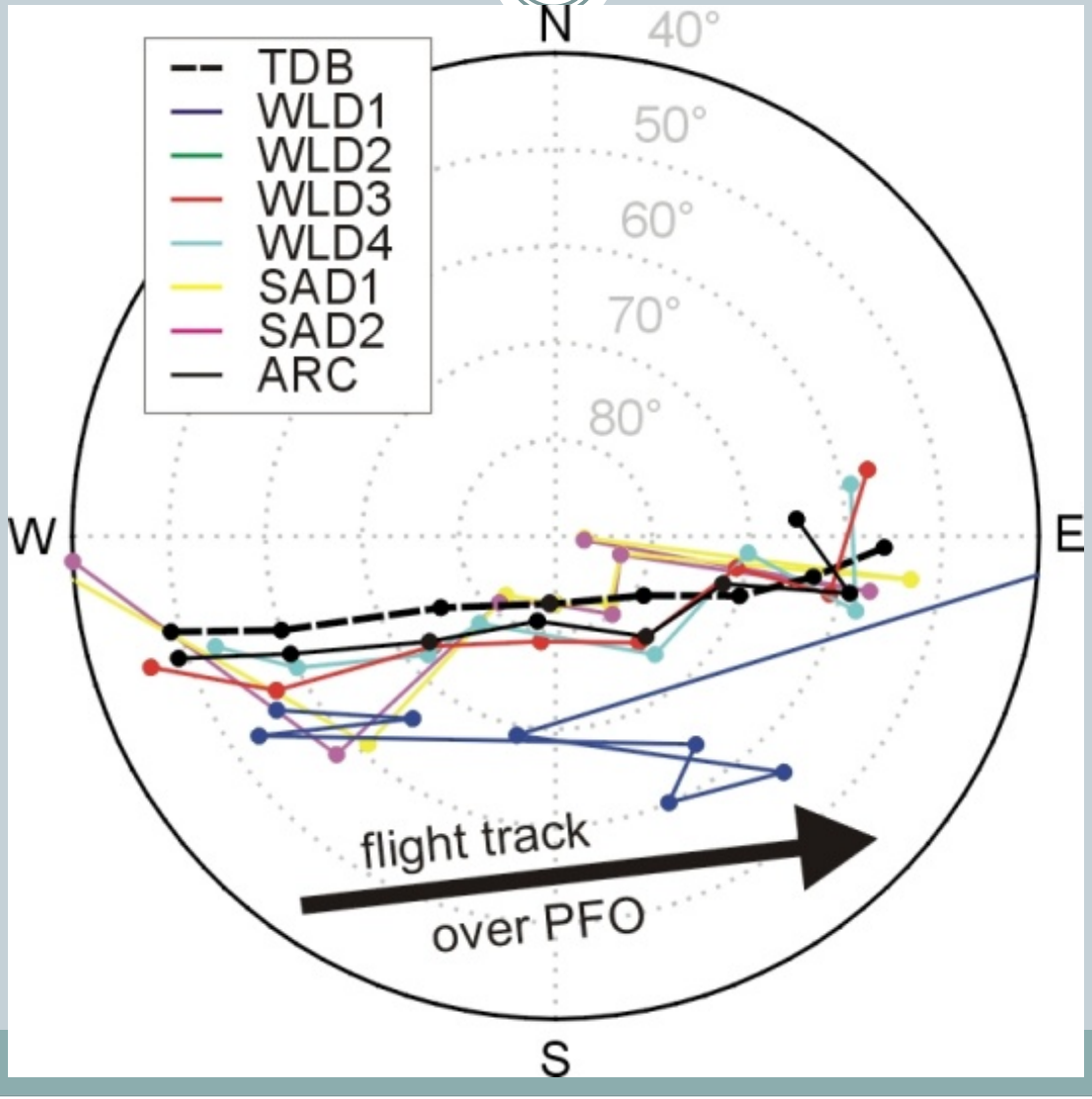

Calibrator: M-sequences with speaker array

- M-sequences: a pseudorandom bit sequence used to modulate a carrier wave.
- Used to overcome peak power limitation problem at the source.
- Used several subwoofer array configurations and tested different frequencies and sensors.
- With single speakers, usually down to 12-14 Hz. We see 8 Hz.
- This technique has much potential.

Calibrator: M-sequences with speaker array