



# Mountain Terrain Atmospheric Modeling and Observations (MATERHORN) Program - An Overview

By

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# **A Multidisciplinary University Research Initiative (MURI)**

**Aimed at**

**Improved weather prediction in complex terrain**

**Office of Naval Research FY 2011 MURI**

**TOPIC #7:**

**Additional support:**

Army Research Office

Air Force Weather Agency

[www.nd.edu/~dynamics/Materhorn](http://www.nd.edu/~dynamics/Materhorn)

## Principal Investigators:

H.J.S. Fernando

(ND)

Eric Paradyjak

(UU)

Stephan De Wekker

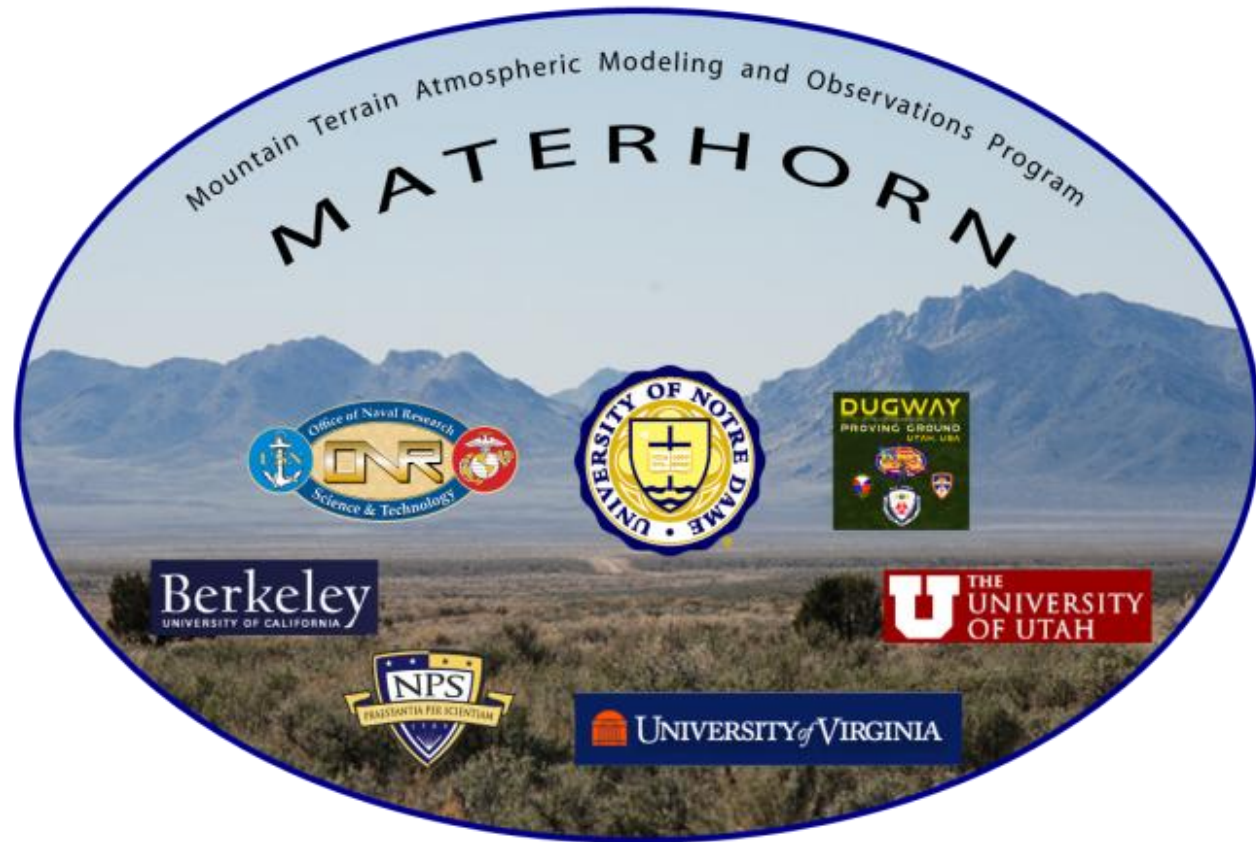
(UVA)

Josh Hacker

(NPS)

Tina Katopodes Chow

(Berkeley)



**Identify Scientific Barriers for Mountain  
Weather Prediction – Workshop Feb 1-2, 2010,  
Tempe, Arizona (26 participants)**

**Scientists  
Practitioners  
Stake Holders**

MATERHORN has four components  
working symbiotically  
across institutions and disciplines

Modeling	(MATERHORN-M)
<b>Experiments</b>	(MATERHORN-X)
Technology Development	(MATERHORN-T)
Parameterizations	(MATERHORN-P)

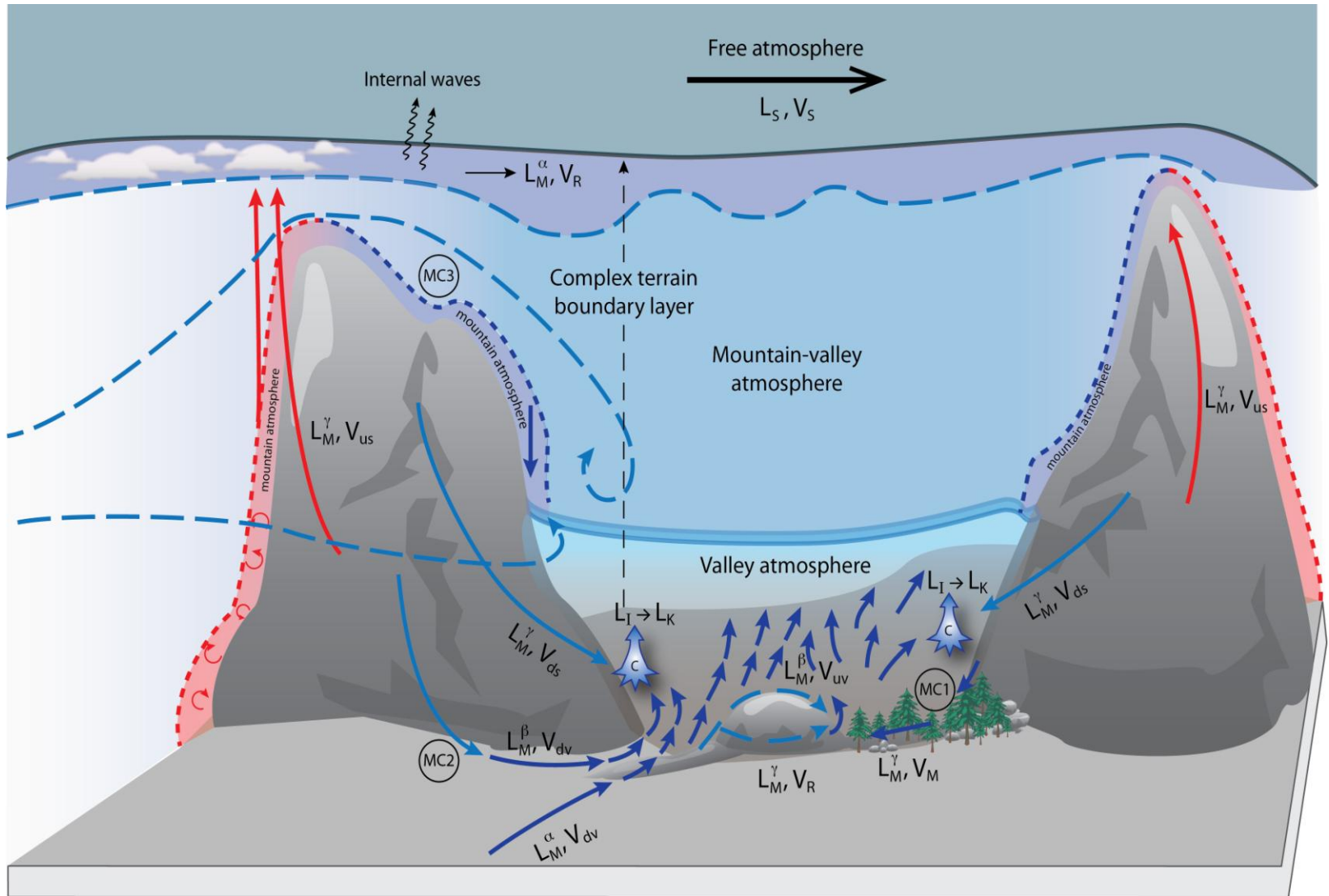
# MATERHORN – X

Granite Mountain Atmospheric Science Test bed  
(GMAST) -- US Army Dugway Proving Ground --  
Utah's West Desert

Calm Winds: October 1 – 31, 2012  
(Autumn)

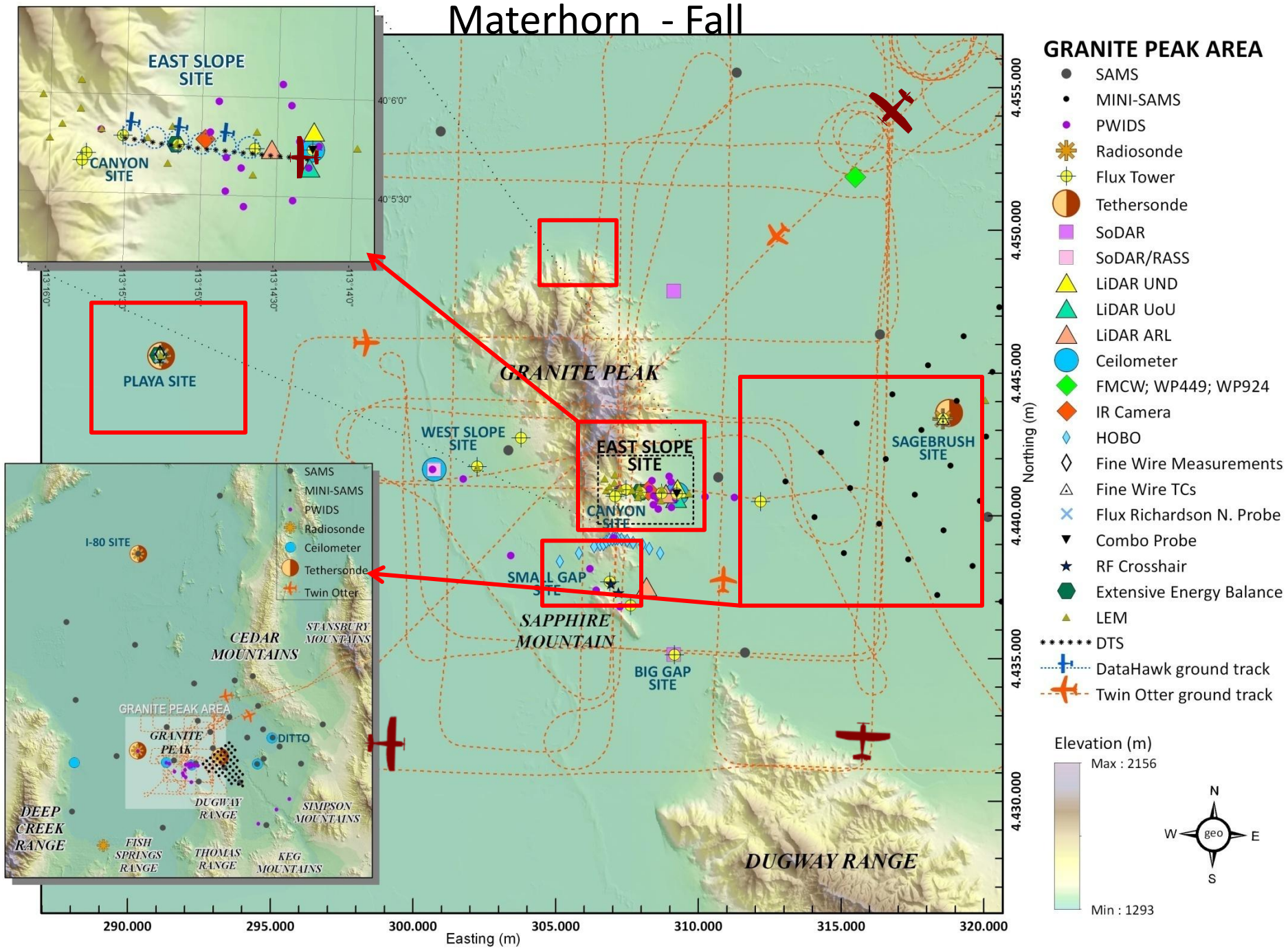
Synoptic Winds: May 1 - 30, 2013 (Spring)

20 Intense Operational Periods - 24 hrs.  
~ 55 TB data



$$L_{Macro}^\alpha \quad - - > \quad L_{Macro}^\beta \quad - - > \quad L_{Macro}^\gamma \quad - - > \quad L_{Meso}^\alpha \quad \dots \quad - - - > \quad L_{Kolmogorov}$$

# Materhorn - Fall





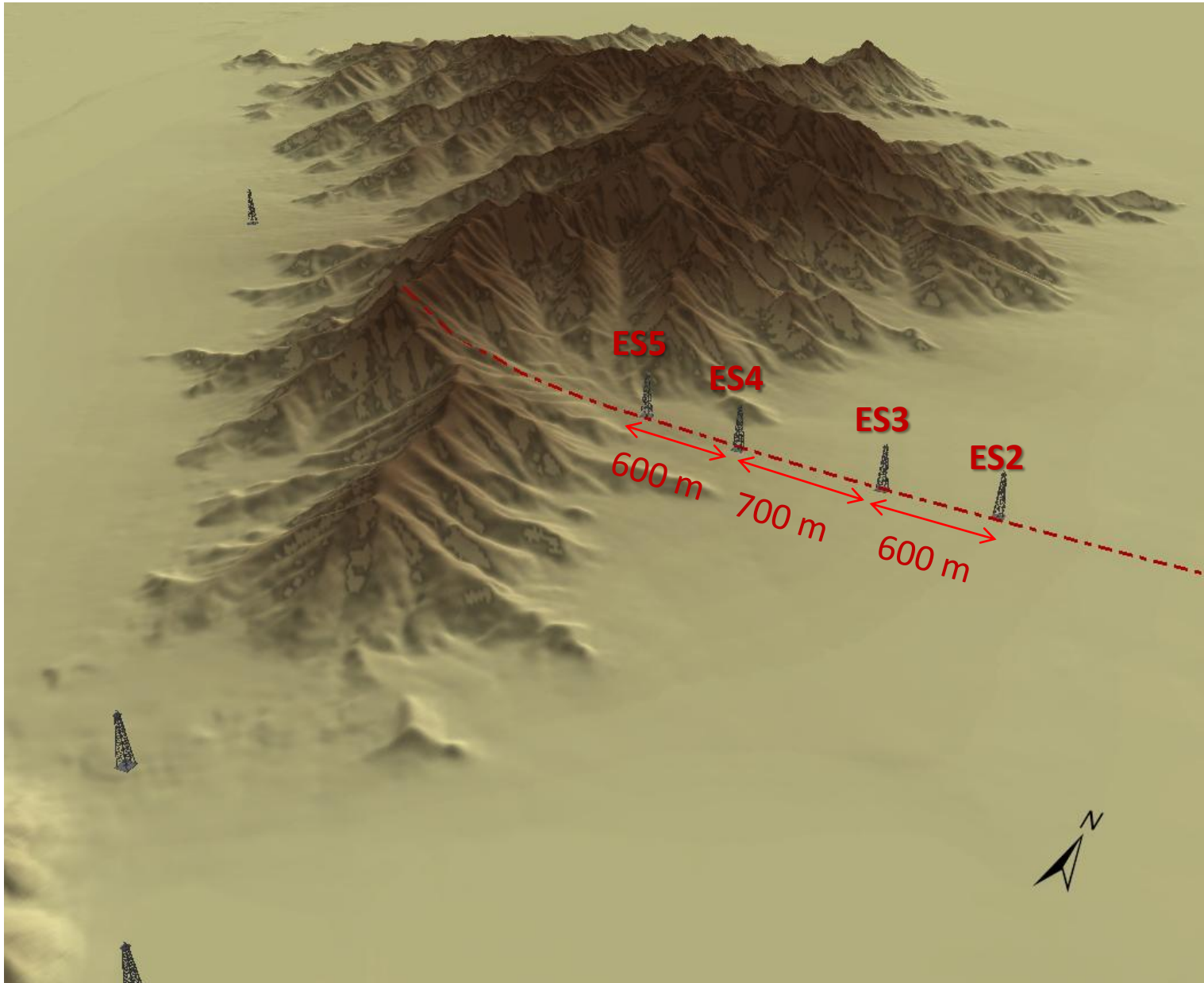
# Granite Mountain

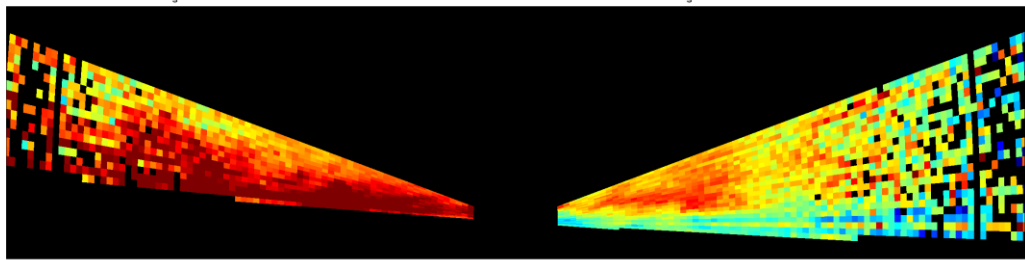
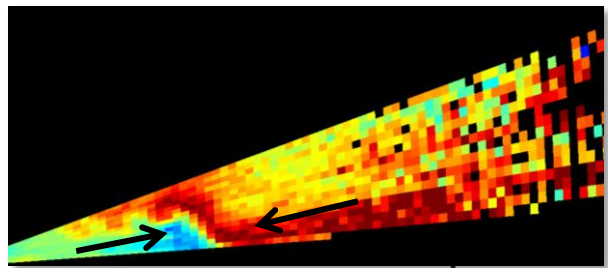
Test Bed [GMAST]

US Army Dugway Proving Ground



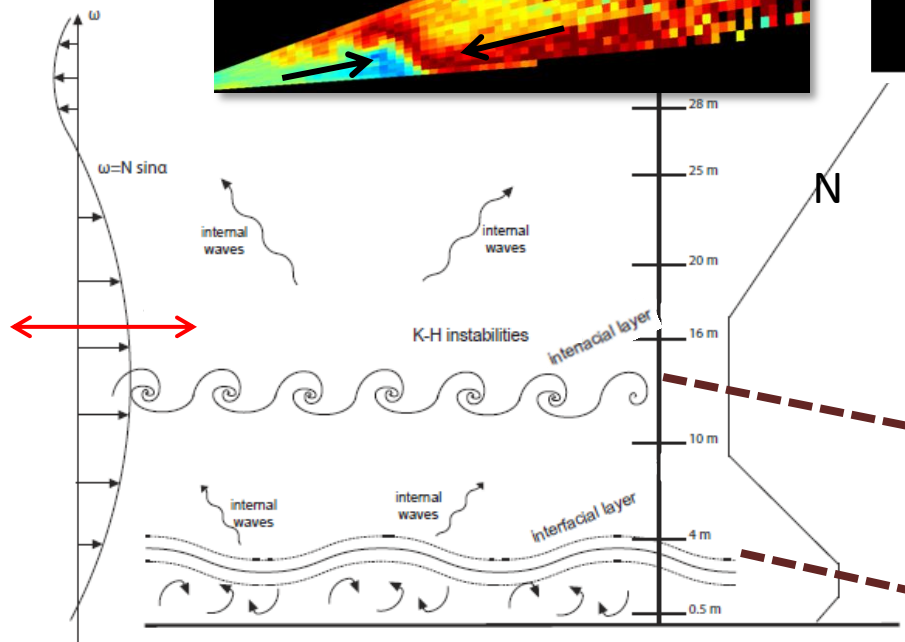
# East Slope of Granite





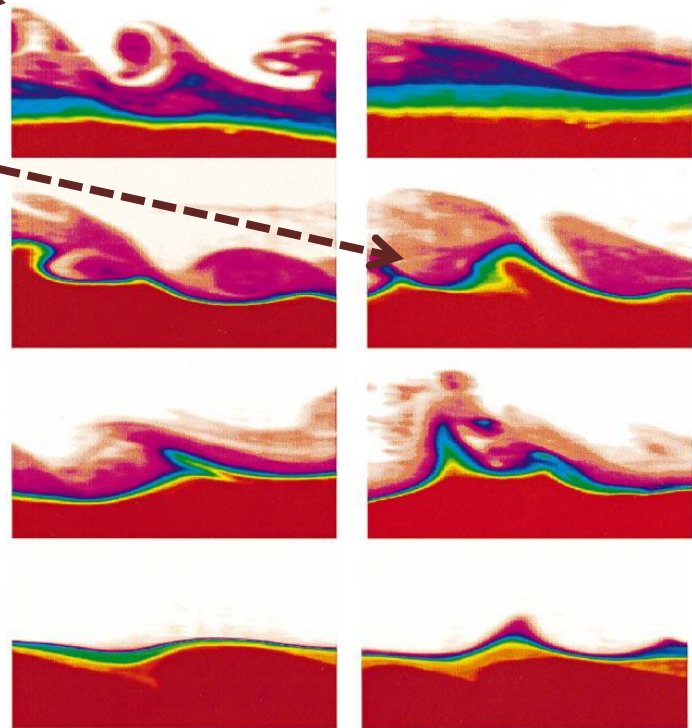
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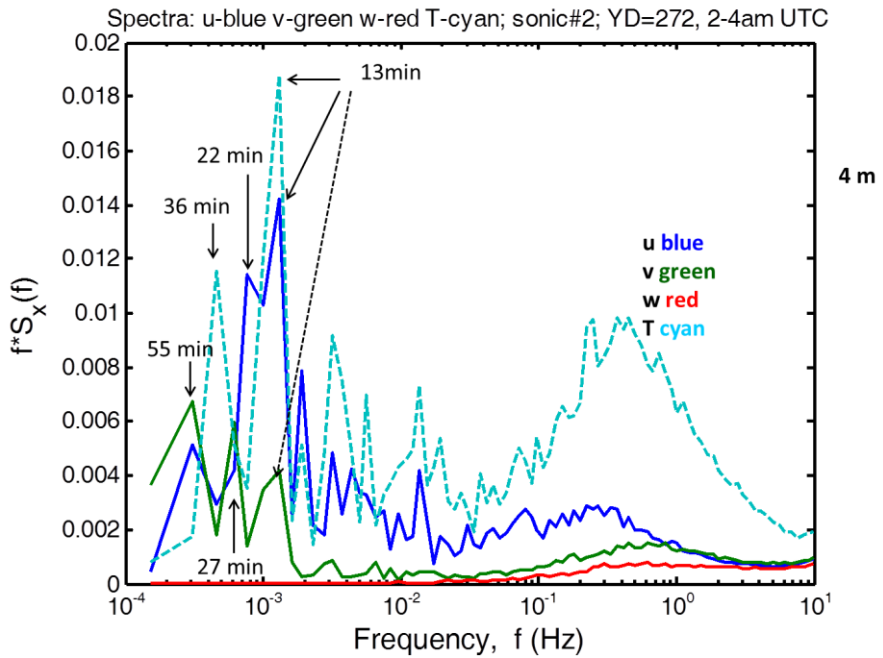
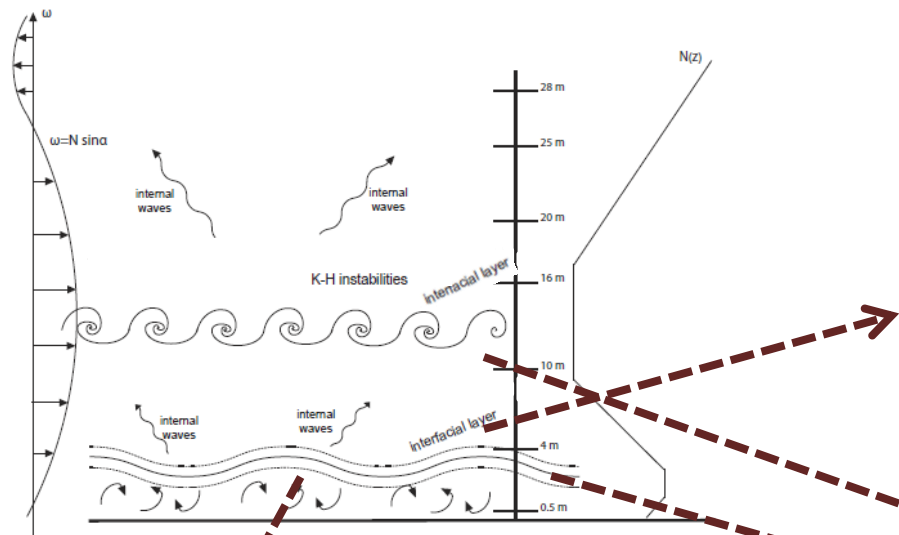


From Laura Leo

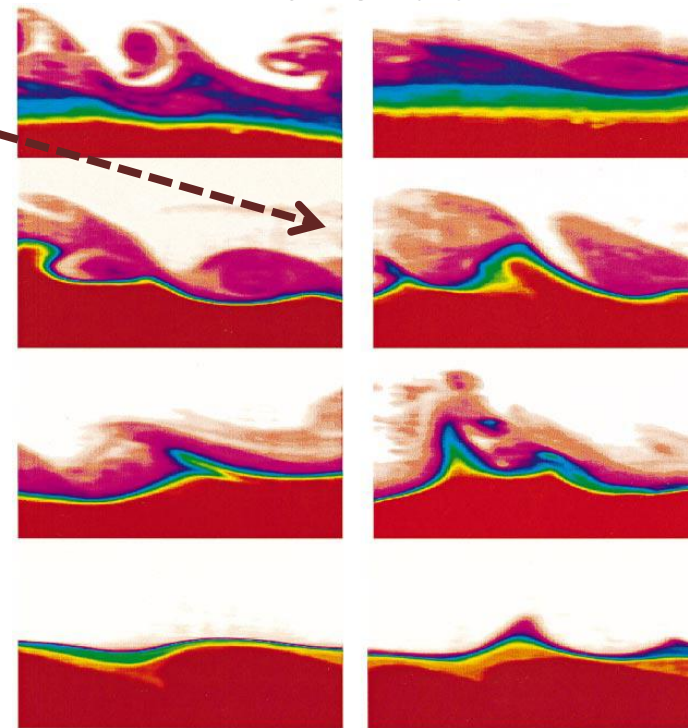
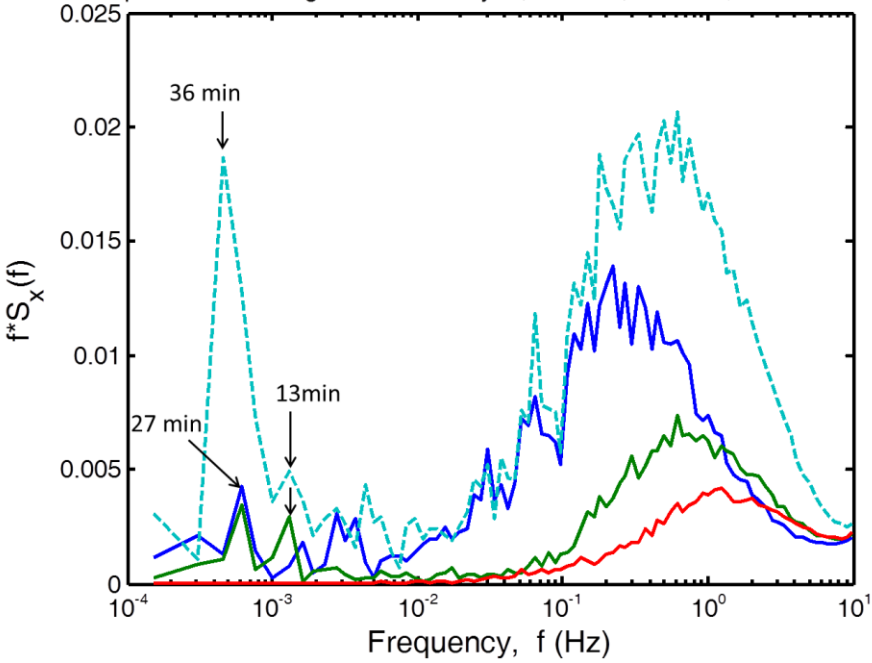
Chris Hocut and Sebastian Hoch



Strang and Fernando (2001)



Spectra: u-blue v-green w-red T-cyan; sonic#1; YD=272, 2-4am UTC



Strang and Fernando (2001)

*Keep unravelling mysteries  
Fog experiment in 2015!*

**THANK YOU!**

