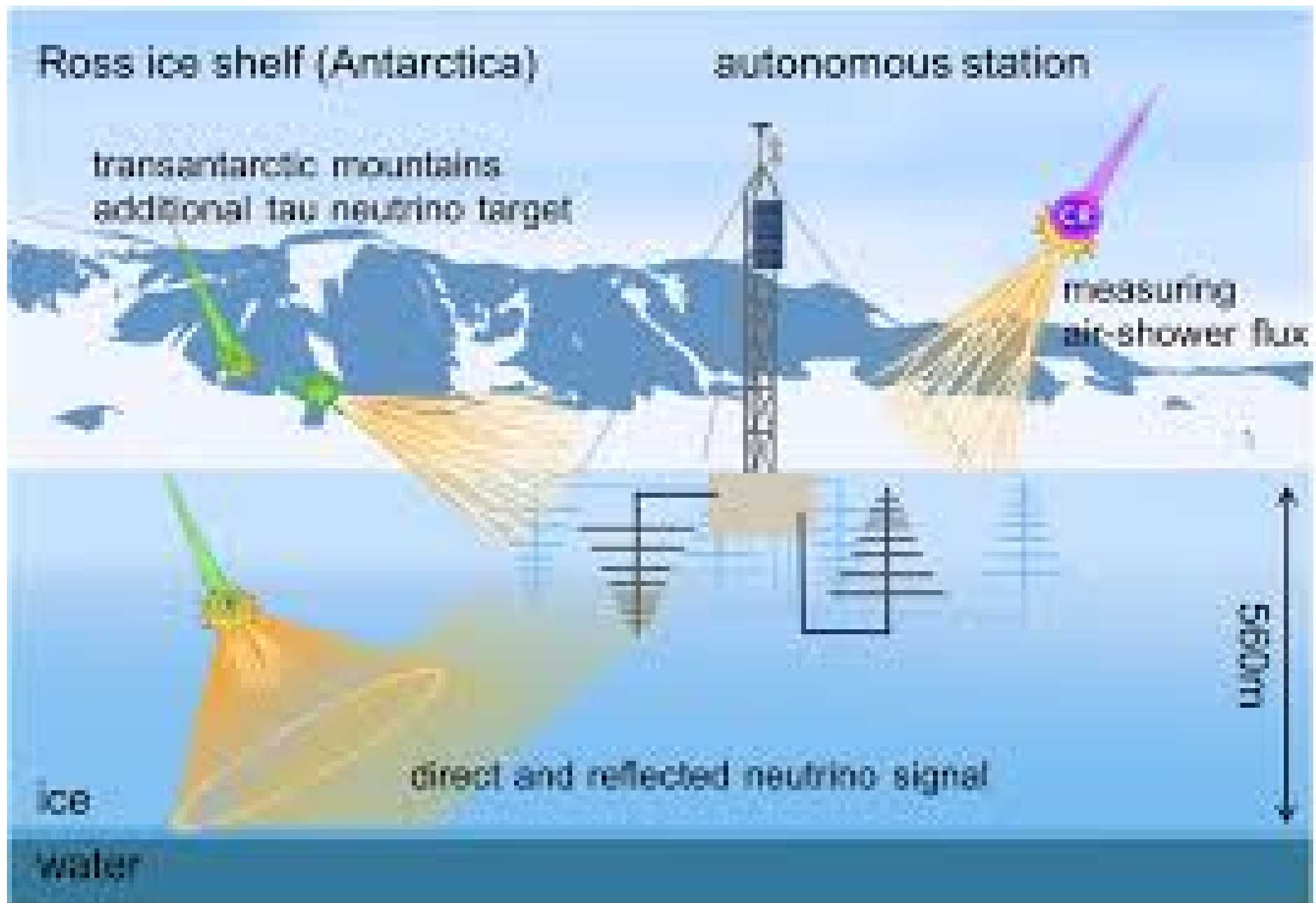


ANITA

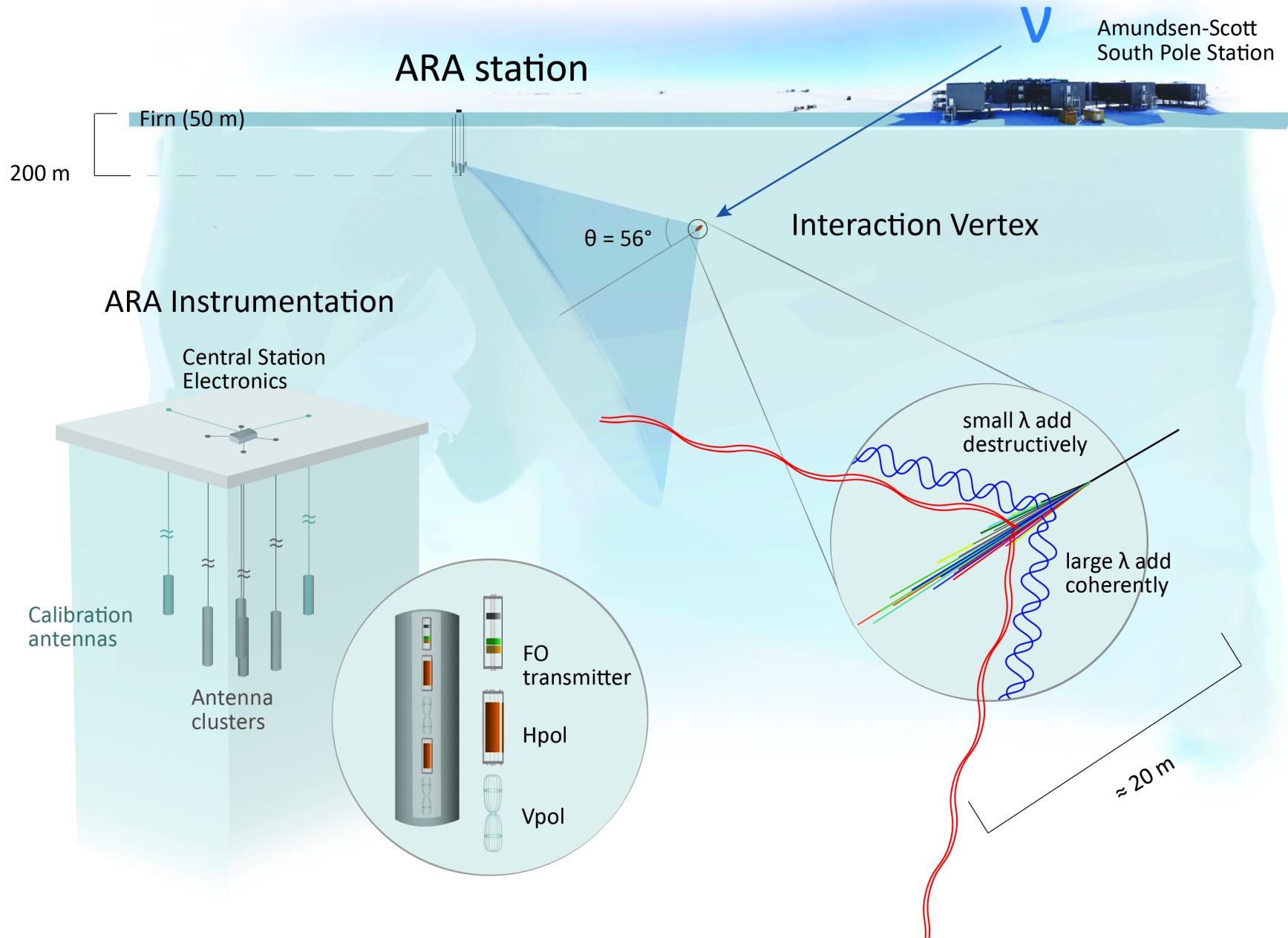
Surface Deployment Strategy



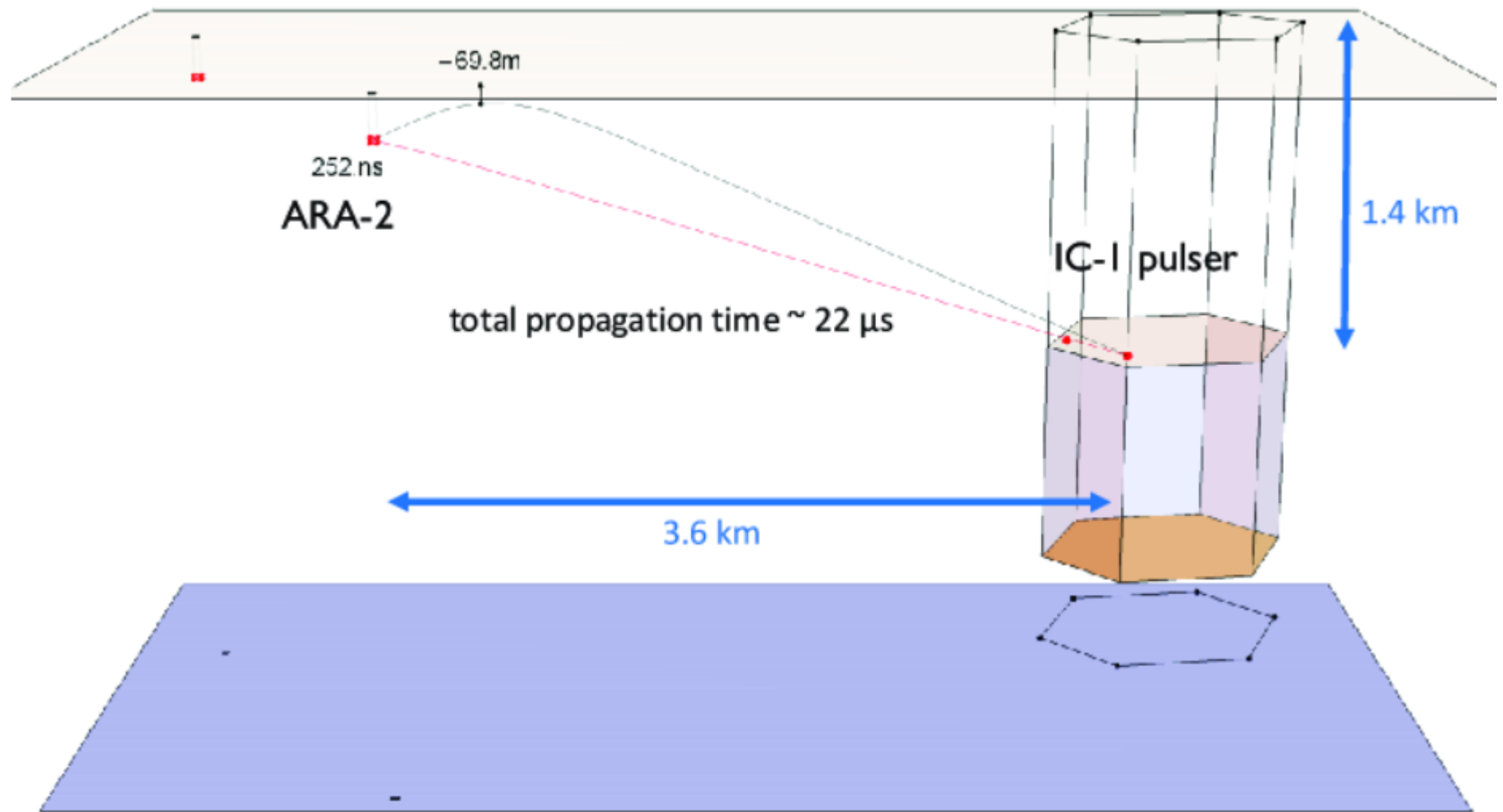
Embedded deployment strategy



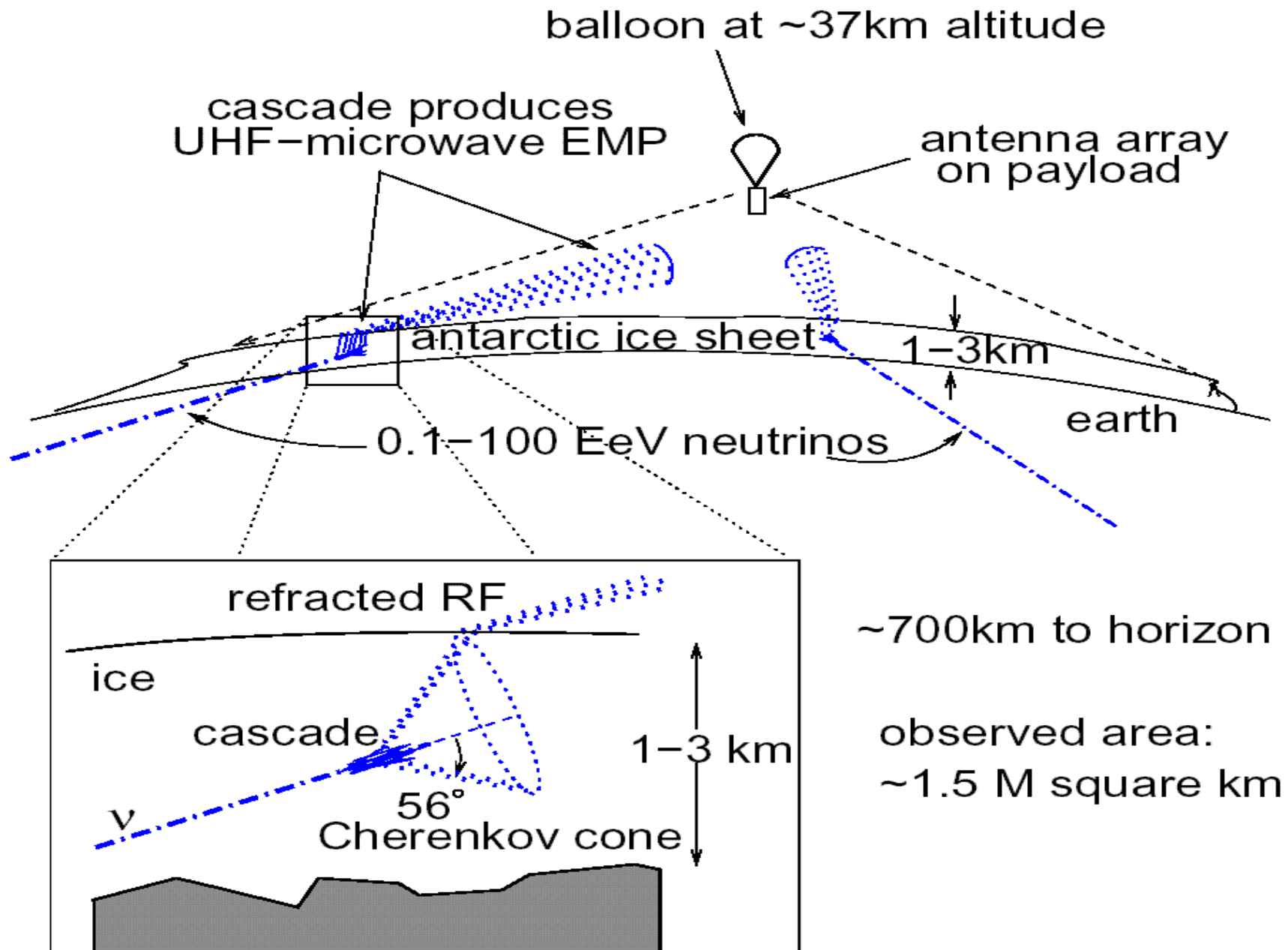
Detection of ultrahigh-energy neutrinos in ARA



Direct and refracted rays from IC-1 to ARA-2 (center)

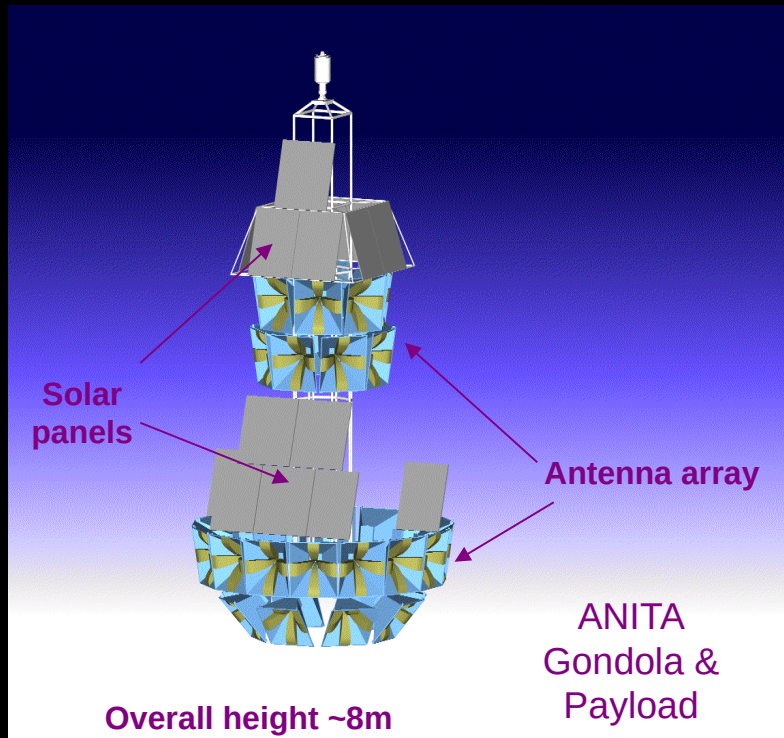


Or, view ice from above: ANITA concept

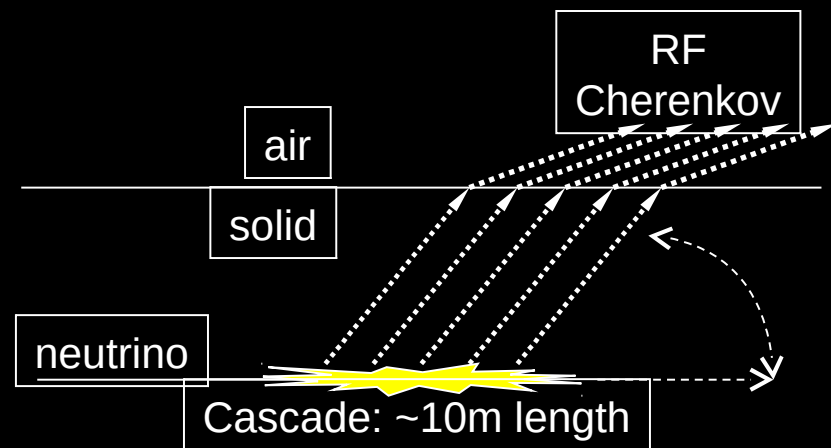


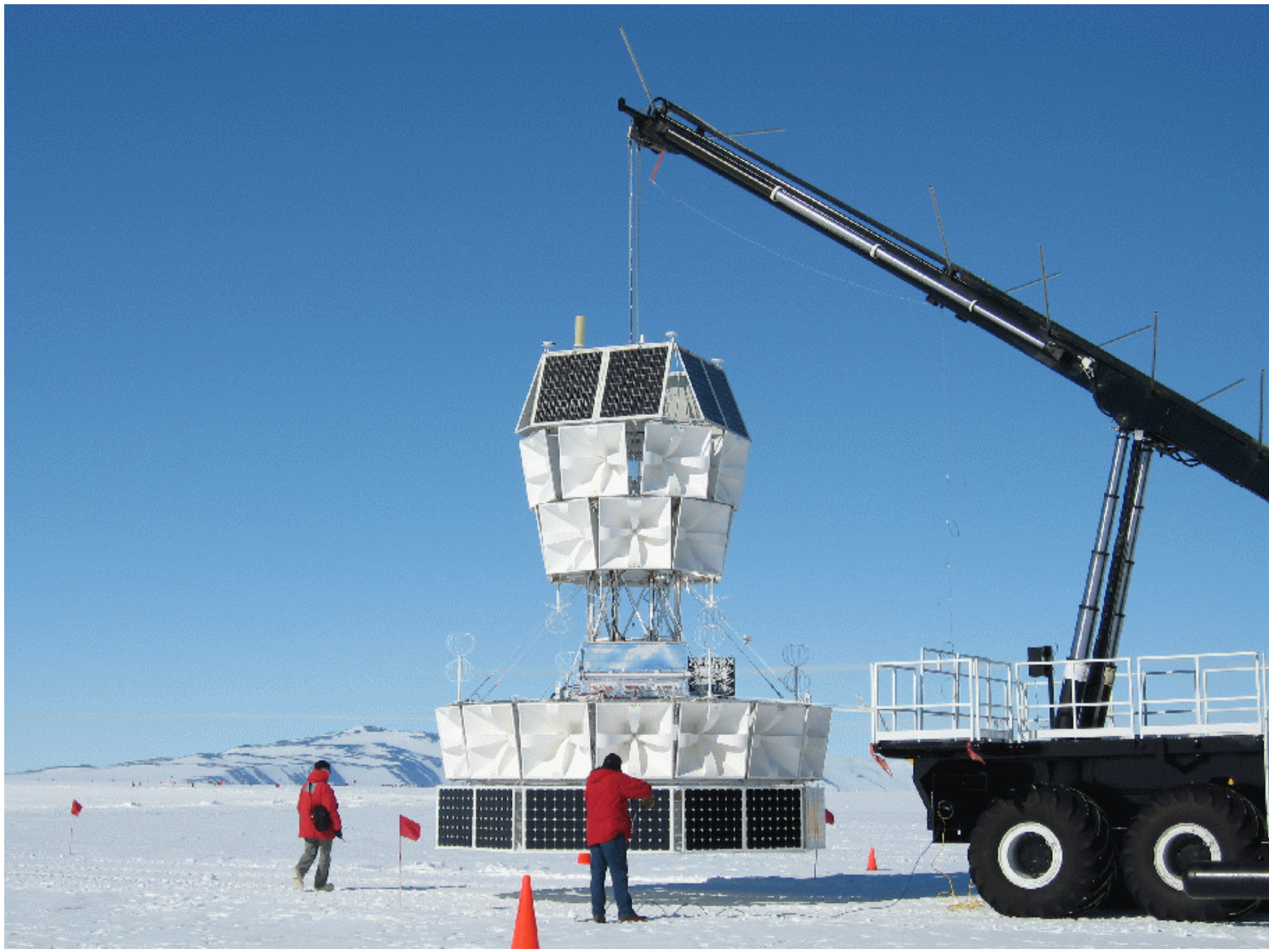
Antarctic Impulsive Transient Antenna Experiment

2004-2017-balloon borne CR astronomy



searching for GZK
neutrinos with radio
detection in Antarctic ice







Estimate the amount of time
required to reach 38 km, assuming
zero wind resistance



ANITA launch; 1 → 6

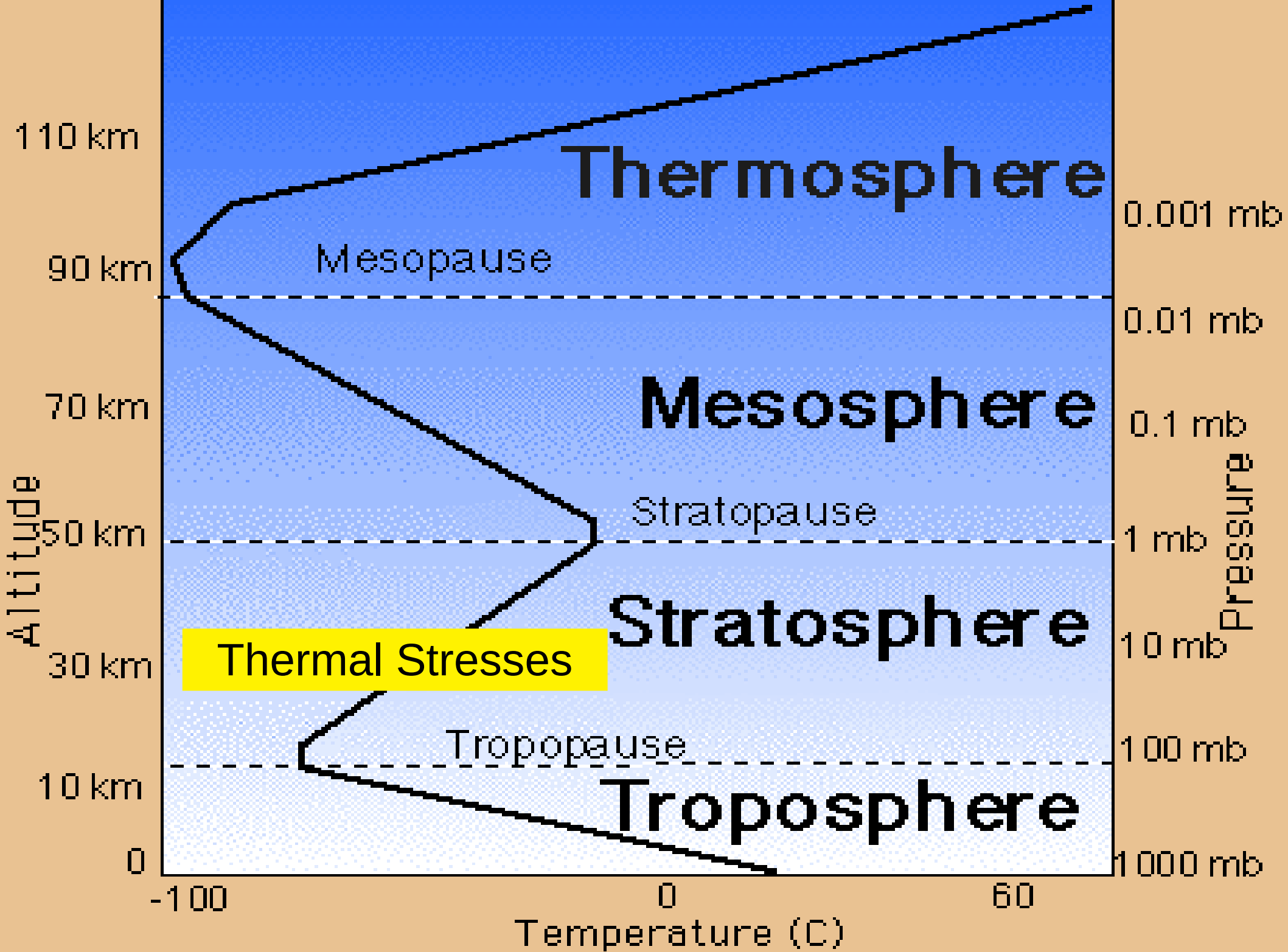


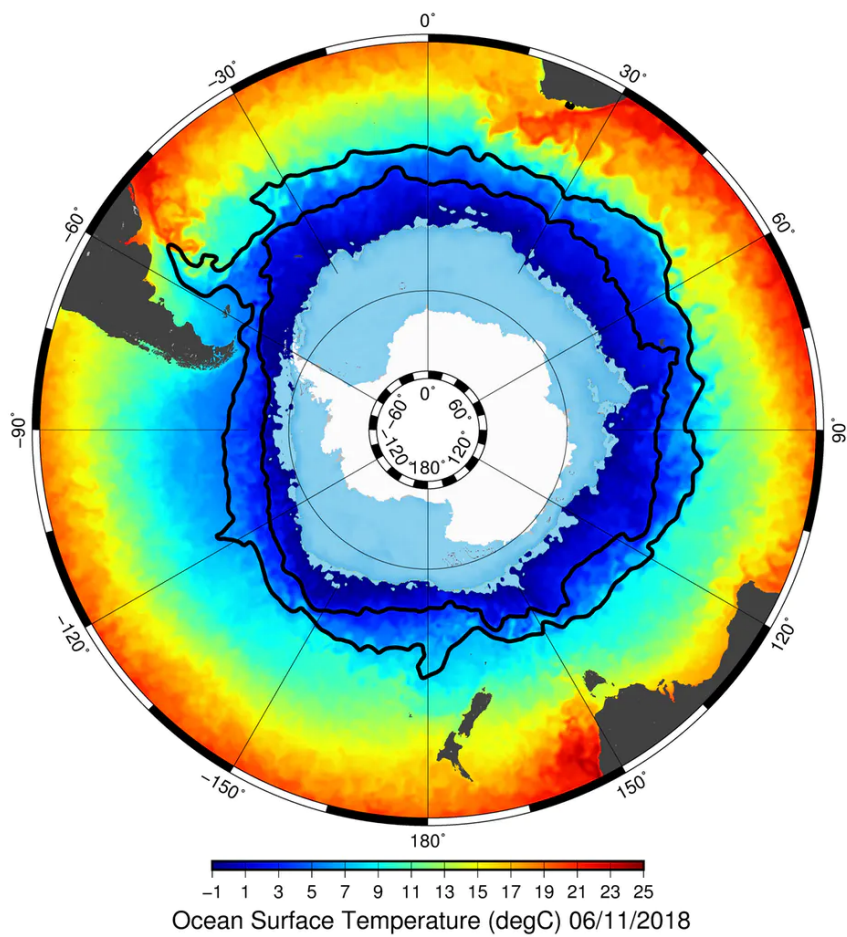
После выпуска



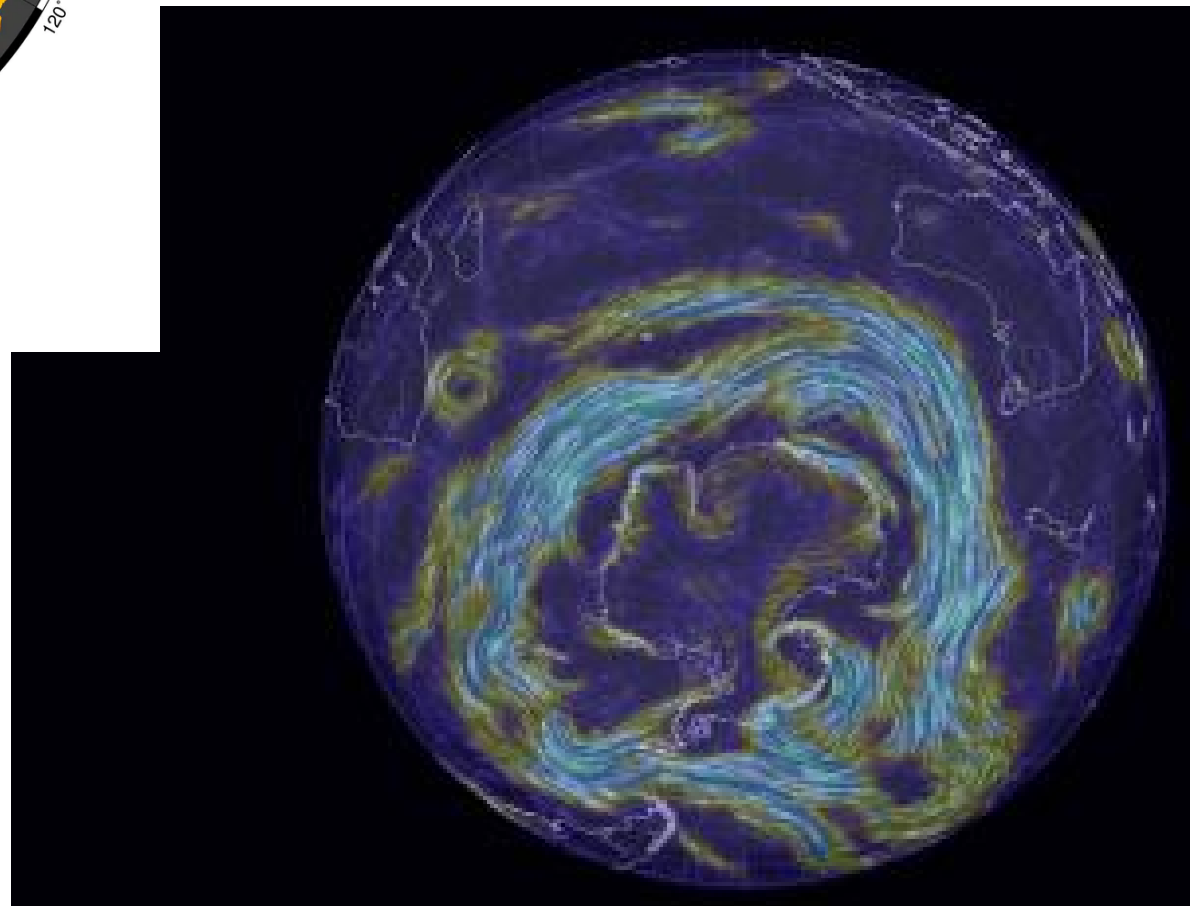


January 9,
2015
ANITA `cut-
down'

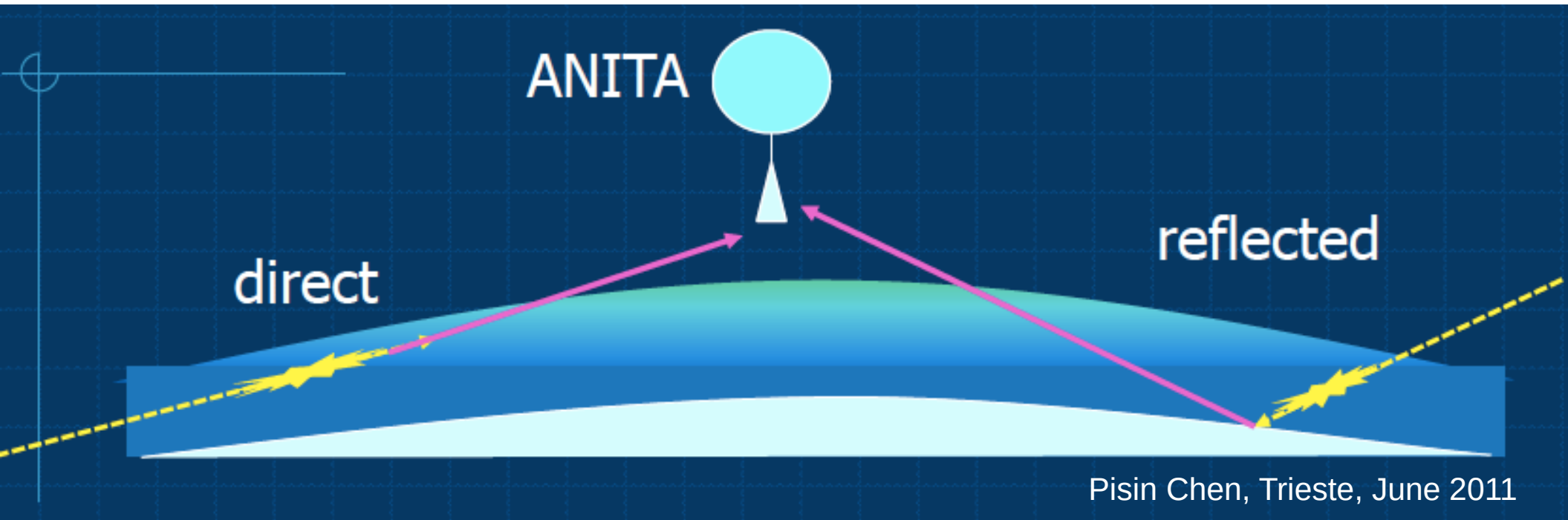




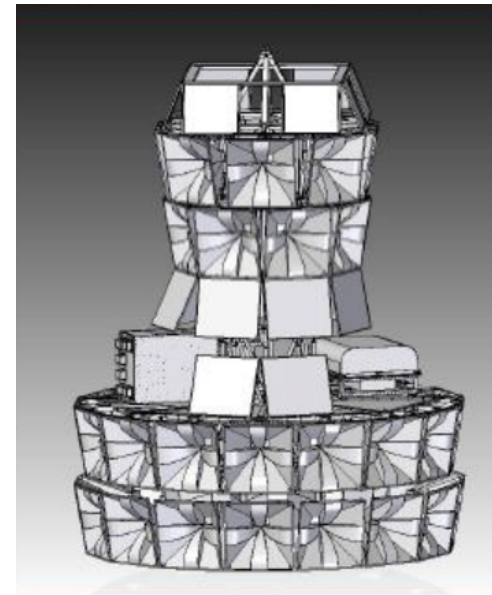
Satellite temperature map (12/2014)



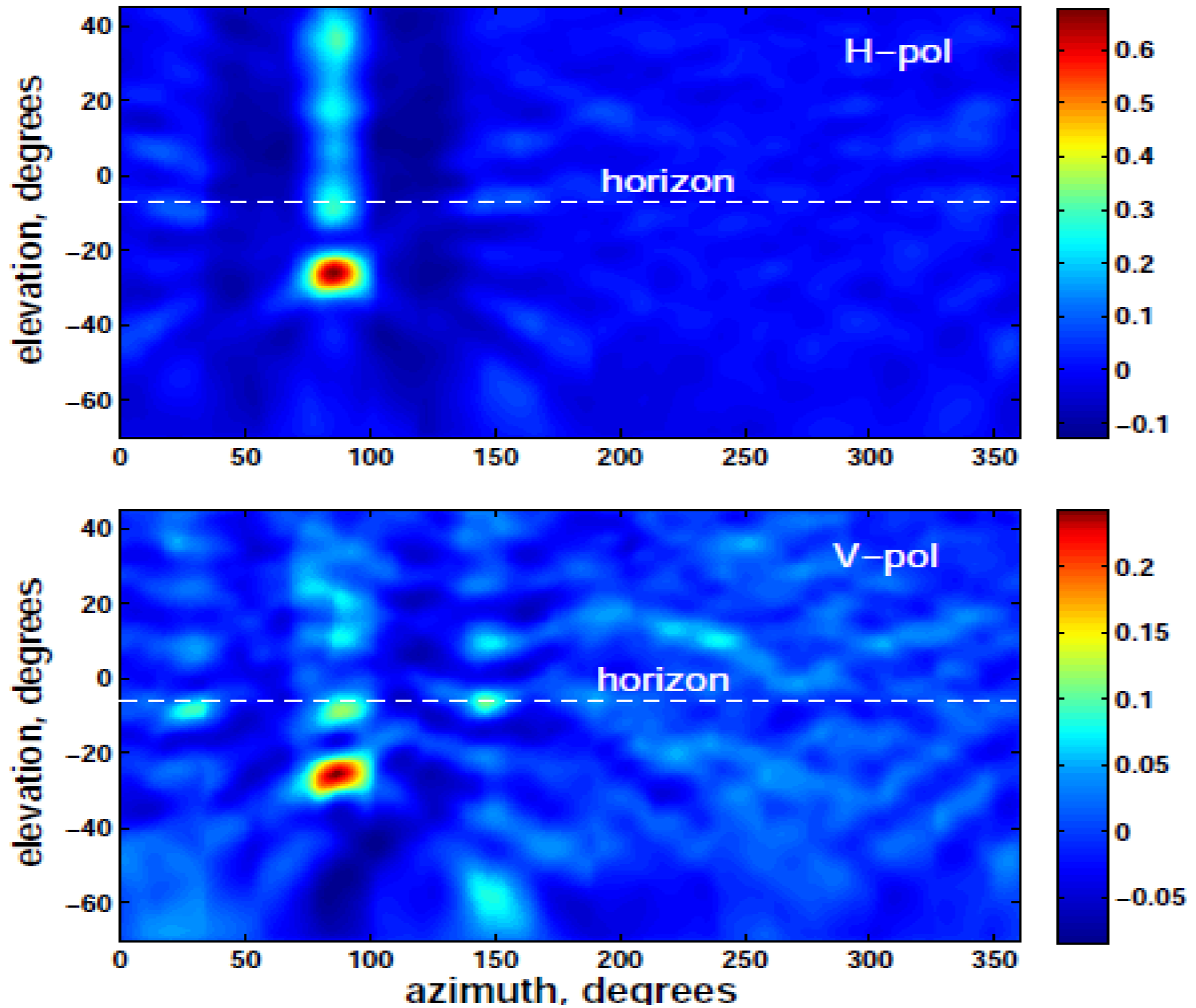
ANITA also detects $\sim 10^{19}$ eV CR



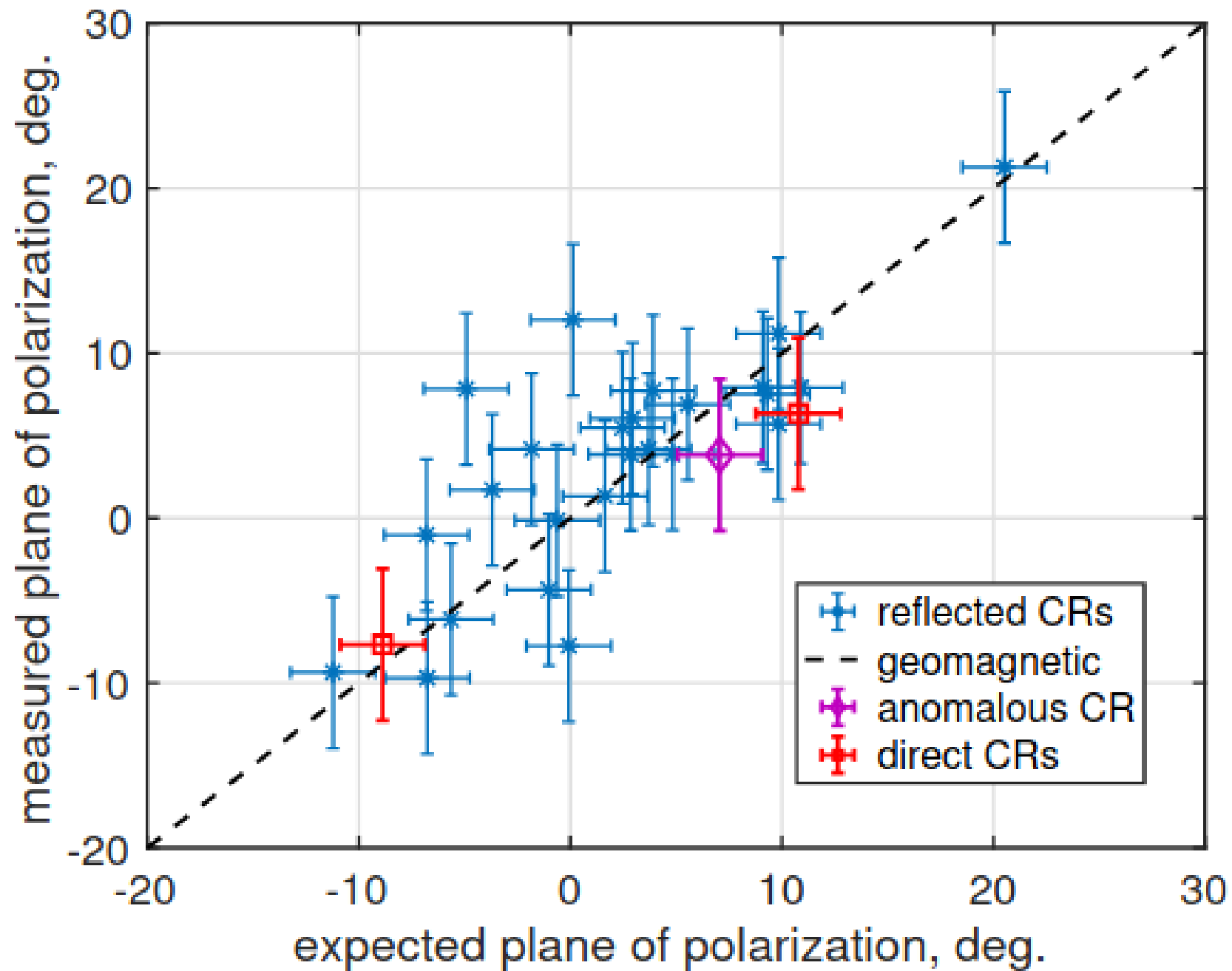
ANITA-III optimized for UHECR as well as ν



Interferometric observation of Ultra-High Energy Cosmic Rays (10 EeV) with ANITA



Correlation with local magnetic field



SLAC T-510 testbeam experiment

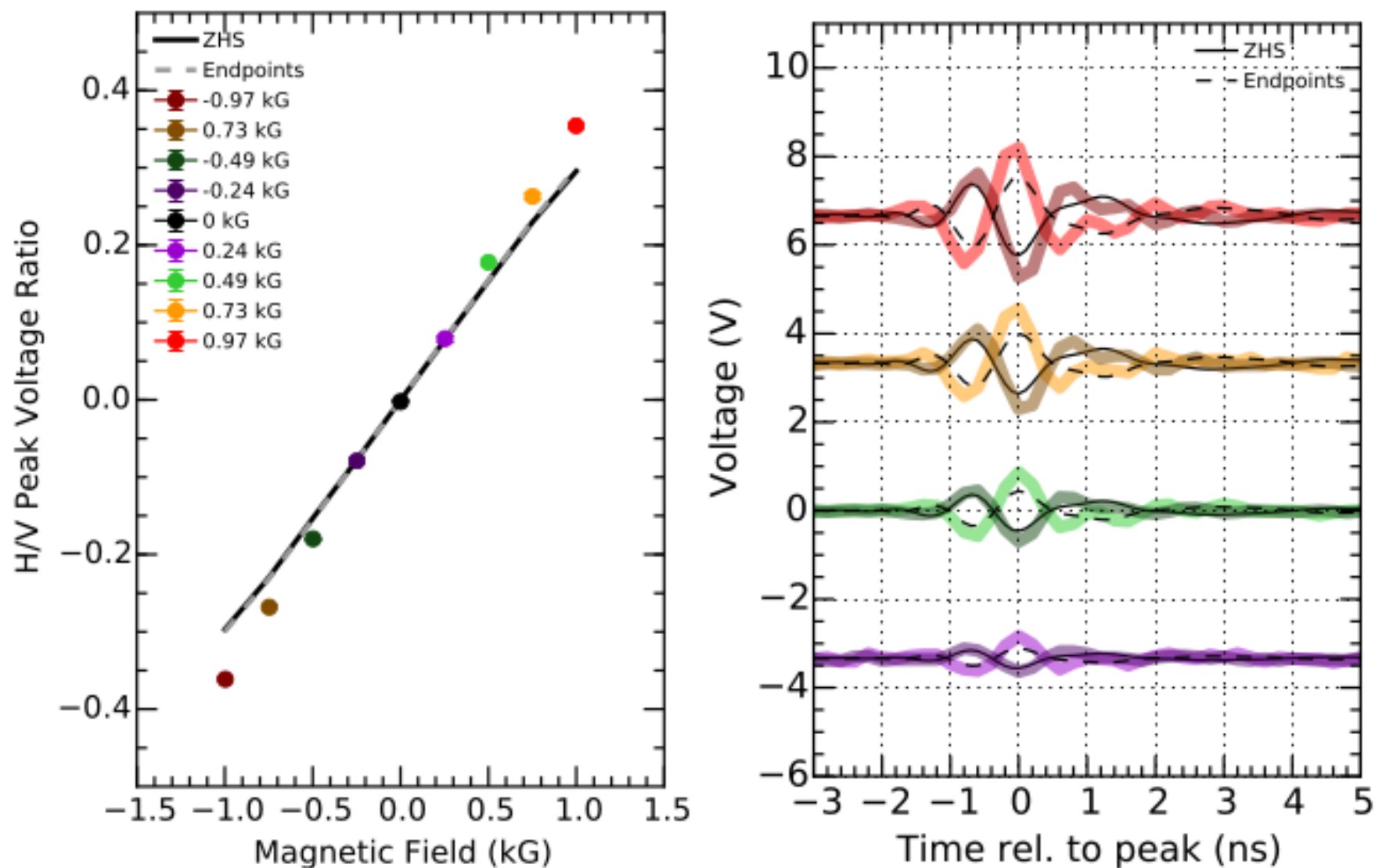


FIG. 6. Left: horizontally polarized signal normalized by vertical showing the expected linear behavior vs. magnetic field.

THE MYSTERY EVENTS!

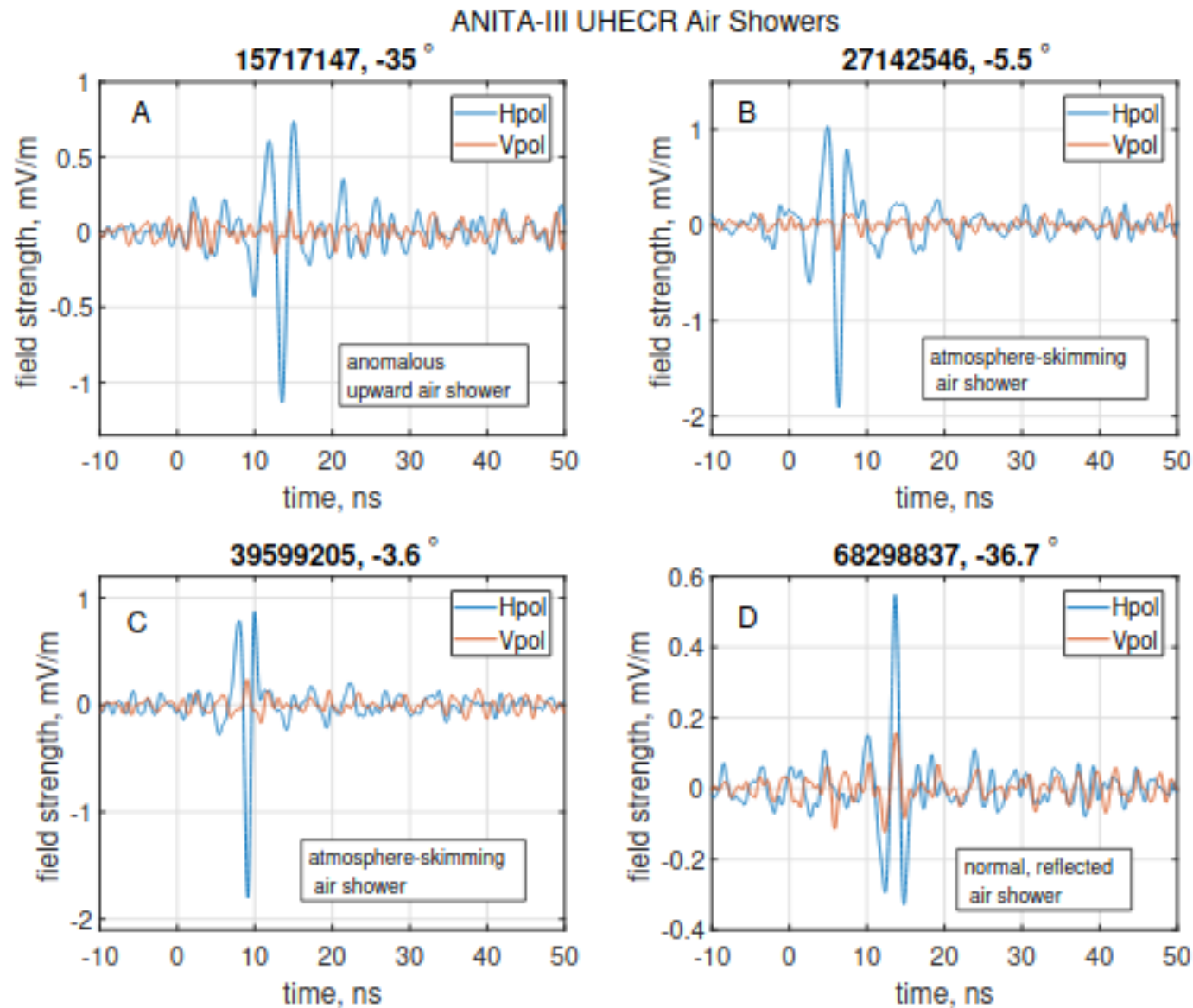
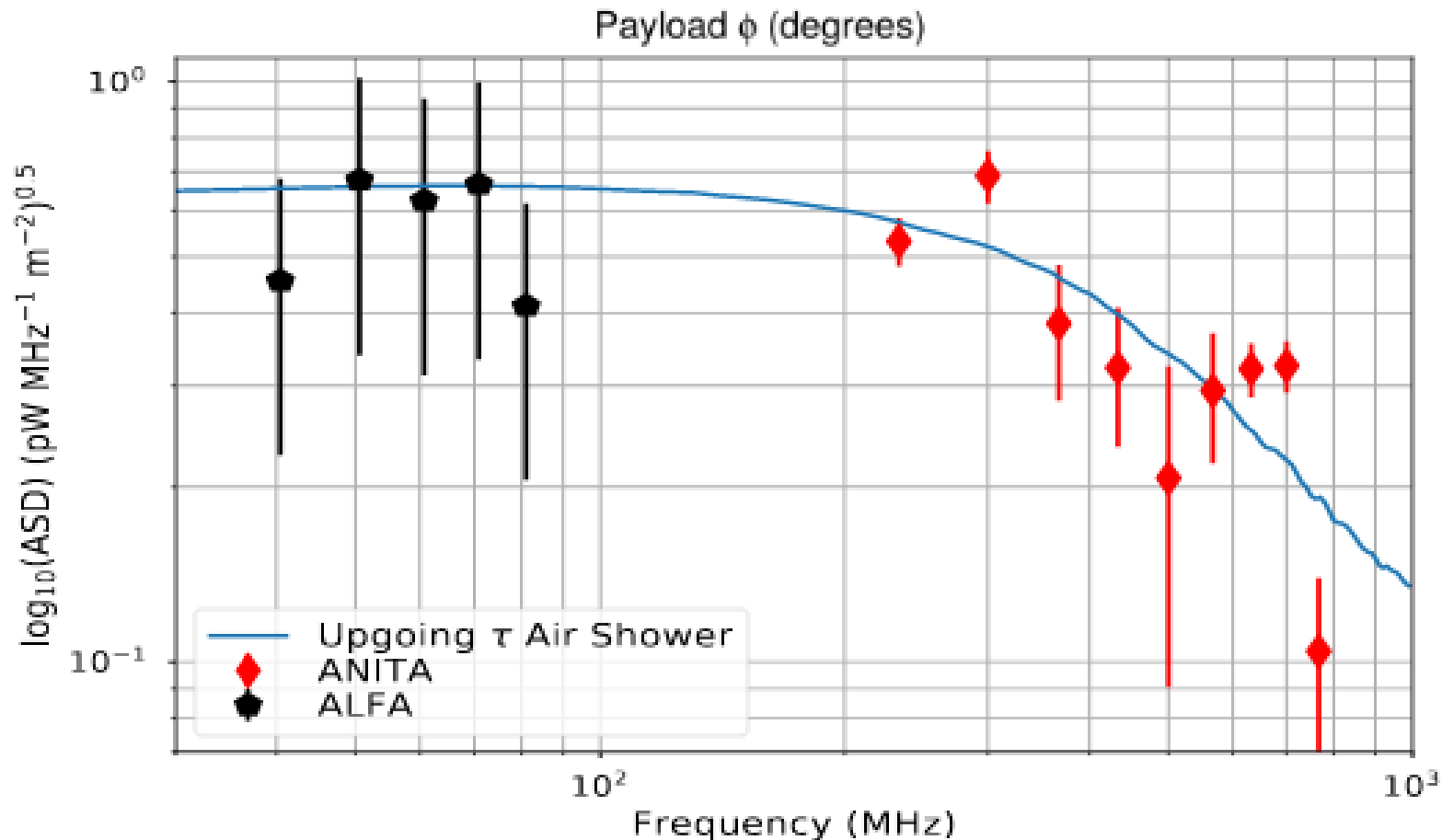


FIG. 3: The three non-inverted polarity events are shown in panels A,B,C. Panel A shows the anomalous event, with the same polarity

What is it, what is it, what is it?

Spectrum matches tau neutrino!



Other Possibilities: Surface Roughness (Dasgupta & Jain, 2019)

BSM models (people in this room right now)

Transition Radiation Backlobe (Prohira & deVries)

Triboelectric Effect (dzb, alisa nozdrina (KU), masha mikhailova (MEPhI))

surface roughness from stereoscopic photos



FIG. 1: *Antarctic topography
along Vostok route (I)*

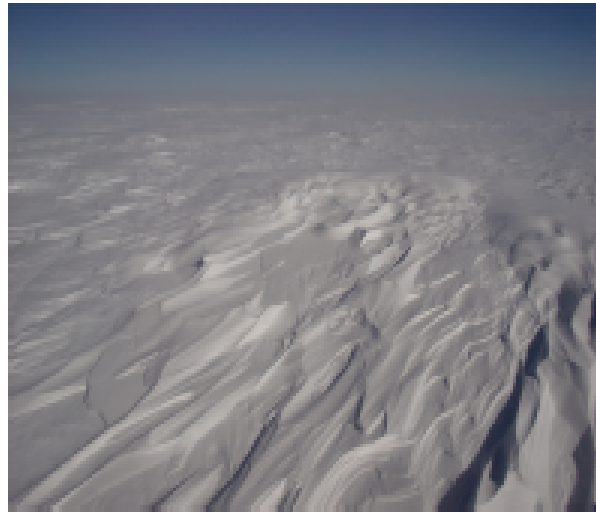


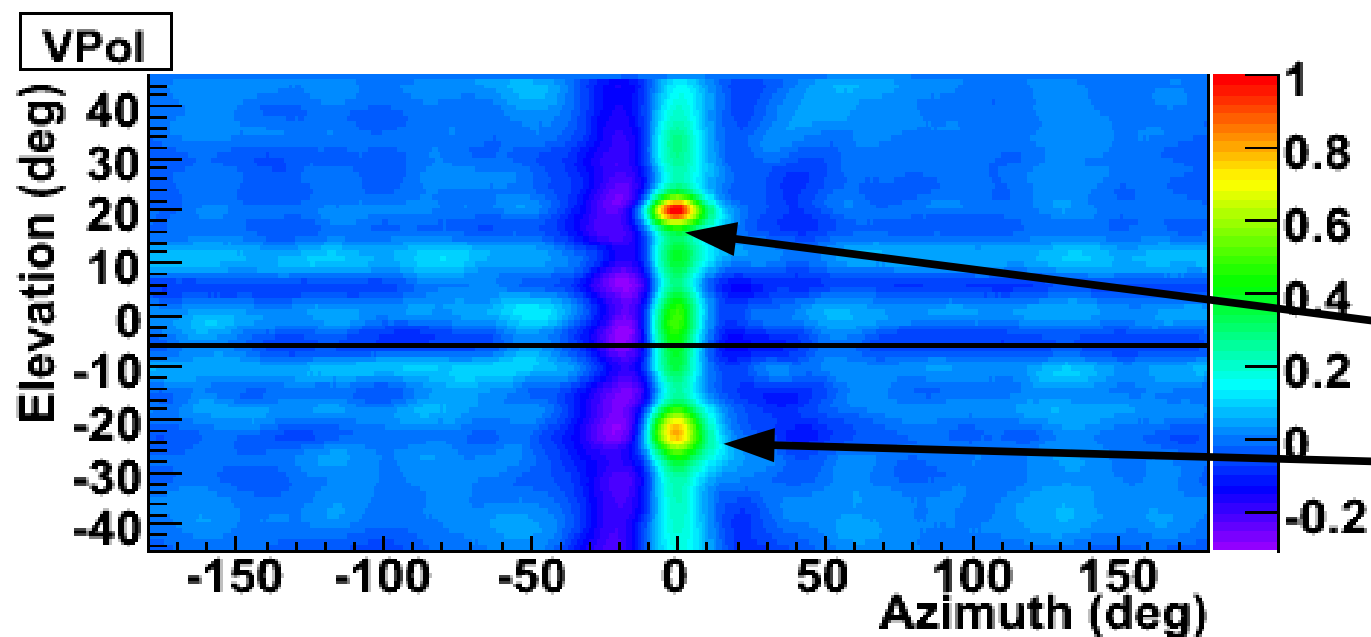
FIG. 2: *Antarctic topography
along Vostok route (II)*



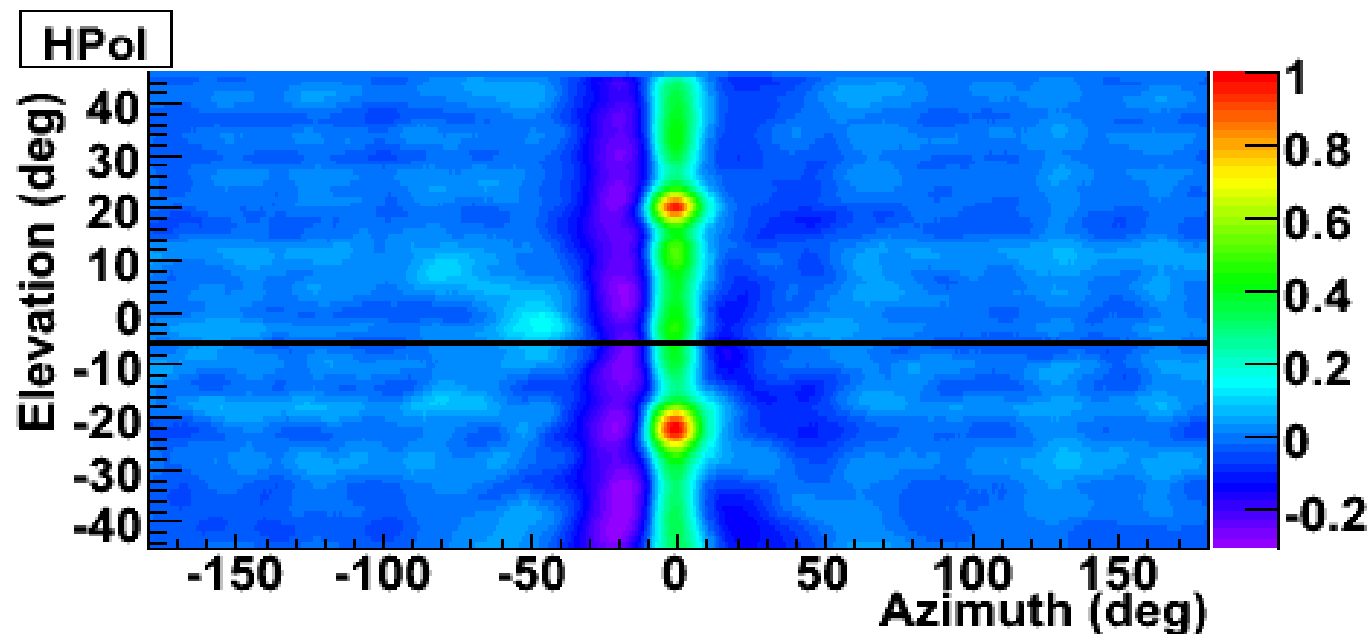
FIG. 3: *Antarctic topography
along Vostok route (III)*

**1/14 Data taken by AARI, St. Petersburg –
reconstruction of point-clouds in progress**

Calibrating surface roughness via Solar albedo



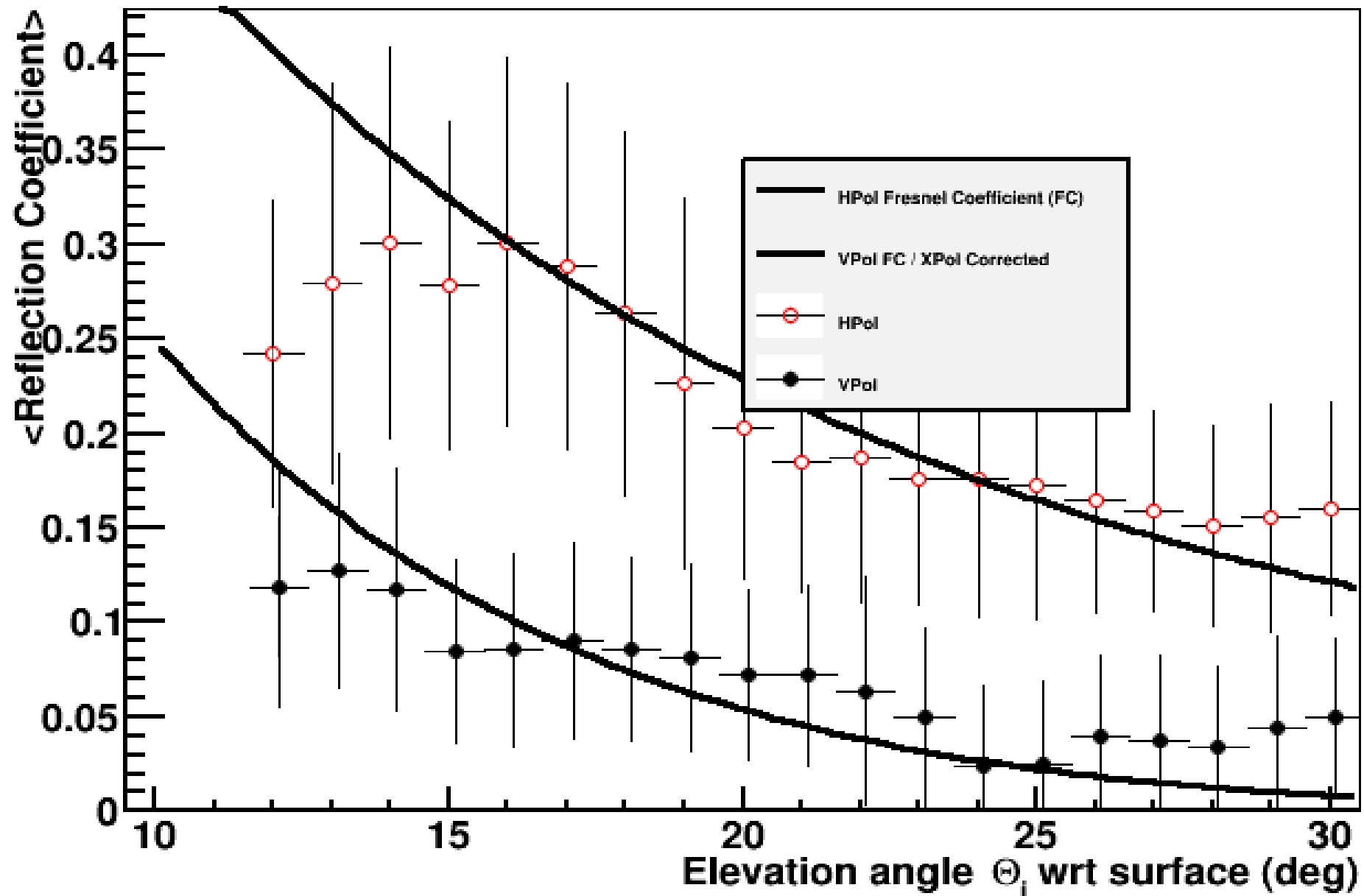
Vpol,
Direct Sun
v. Reflection



Hpol,
Direct Sun
v. Reflection

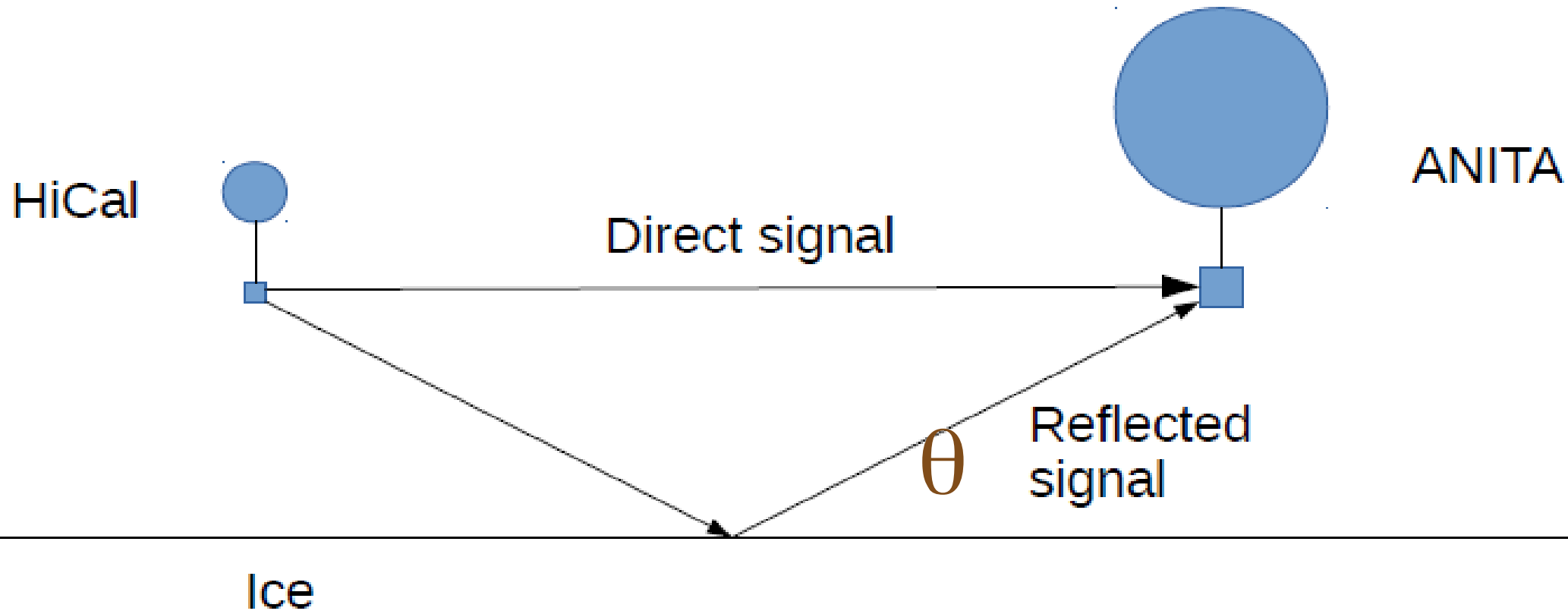
Agreement with Fresnel Coefficients as f(incidence angle)

Avg and rms Reflection Coefficients



HiCal-trailer balloon to measure roughness

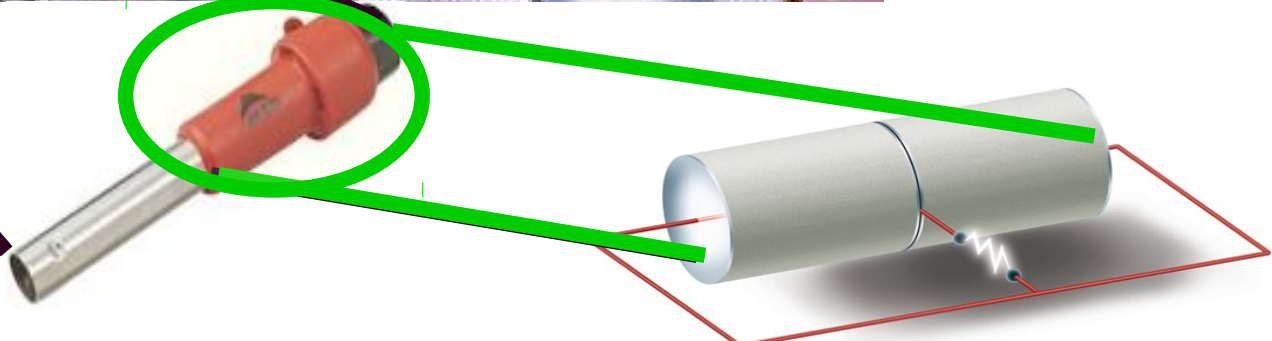
MEPhI, KU, IITK



The Problem:

- On a 5 kg payload, hanging from a balloon, include:
 - Low-cost transmitter capable of generating ~10 kV signal amplitude signals, with duration 10 ns (Kansas U.)
 - Hardware to measure azimuthal orientation of payload, with capability for measuring signal amplitude and provide GPS time stamp (MEPhI)

Low-cost, high-voltage transmitter



Piezo-ceramics

G. Staines*, Helmut Hofmann*,

L.L. Altgilbers**, Ya. Tkach***

*Diehl Munitionssysteme GmbH & Co. KG,
Nuremberg, Germany

**U.S. Army Space and Missile Defense Command,
Huntsville, AL, 35807

***Gomez Research Associates,
Huntsville, AL

"Электромагнитные Явления", Т.3, №3 (11), 2003 г.

Tkach Ya., Shkuratov S., Talentsev E.F., Dickens
J.C., Kristiansen M., Altgilbers L.L., and Tracy
P.T., Theoretical Treatment of Explosive-Driven
Ferroelectric Generators // IEEE Transactions
on Plasma Science. – 2002. – V. 30(5).
– P. 1665–1673.

Compact Piezo-Based High Voltage Generator - Part I: Quasi-Static Measurements

This paper presents the results of an effort to develop and test a piezo-based high voltage generator (HVG). A theoretical model was developed and, in order to verify this model, quasi-static measurements were conducted using a 15 mm diameter and 20 mm long cylindrical PZR-5A piezoelectric element and an electric press driven by a rotating screw. Measurements were made using various load capacitances and resistances and using single and multiple piezo elements. The results of these measurements will be presented. A prototype piezo-based HVG with a diameter of 65 mm and a length of 275 mm was also built and tested and the results will be presented in a follow-on paper. This generator produced almost 400 kV with 3 J of energy stored in the generator.

RF transmitter

LWA-ty... Besson, ... Яндекс... UW-Mad... size of v... distance... redshift ... distance... neutrino... Distance... home d... Brinkma... Brink...

www.homedepot.com/p/Brinkmann-Universal-Push-Button-Ignitor-812-7221-S/203016481

home depot piezo barbeque lighter

b1 Runs ЭКО Вести КП ydx a.pdf

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Gift Cards

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Cart

Local Ad

Store Finder

Credit Center

Specials & Offers

Shop By
Department

Search All

What can we help you find?



DIY Projects &
Ideas

Sign In or Register
Your Account

Home > Outdoors > Grills & Grill Accessories > Grill Replacement Parts > Other Replacement Parts

Brinkmann | Model # 812-7221-S | Internet # 203016481 | Store SKU # 211787

Universal Push Button Ignitor

★★★★★ (11) Customer Images (3) Write a Review Questions & Answers (6)



\$12.97 / each



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Atlanta, GA 30339

Change Pick Up Store

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Aisle 51, Bay 012

Pin it

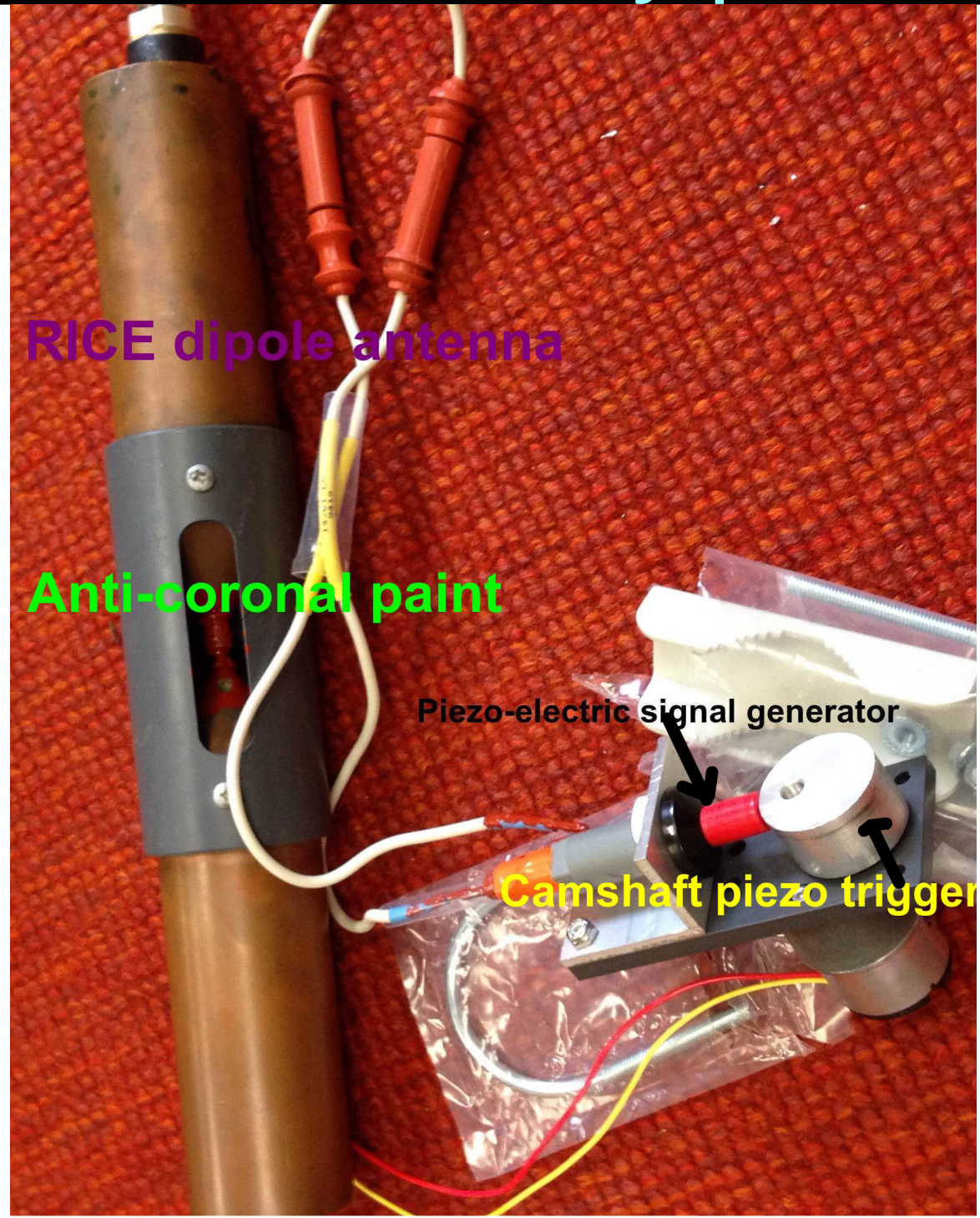
Share



Feedback

More precise surface reflectivity probe

- 12/14: ANITA HiCal: Pathfinder class balloon, launched after main ANITA-3 launch
 - Tx emits both direct + surface-reflected signal
- Hardware:
 - “custom” transmitter that mimics EAS spectrum (ignition coil or piezo sparker [\$10 from WalMart]) fed into a RICE-type dipole antenna



HiCal sparker at 5 mB



HiCal Launch (Jan. 5, 2015)



Flight Paths, Dec. 2014-Jan. 2015

NASA Long Duration Balloon (LDB) Site at Willy Field, McMurdo Station
2014-2015 Antarctica Operations
(With Support from NSF and USAP)

Balloon Tracking

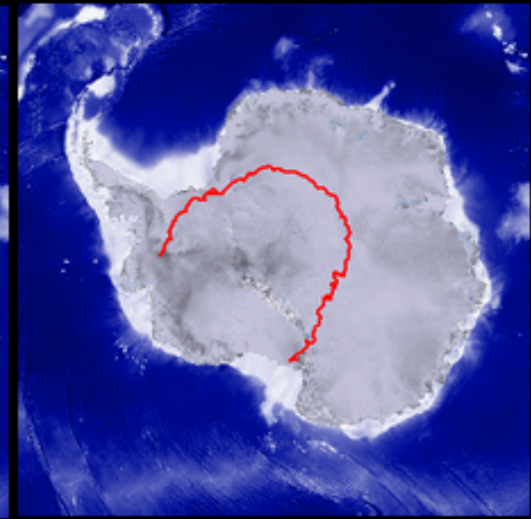
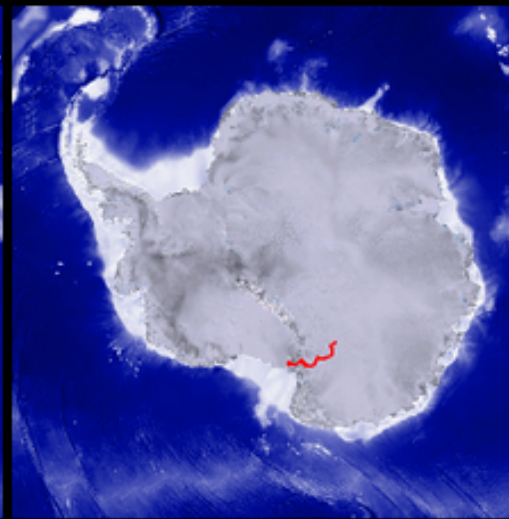
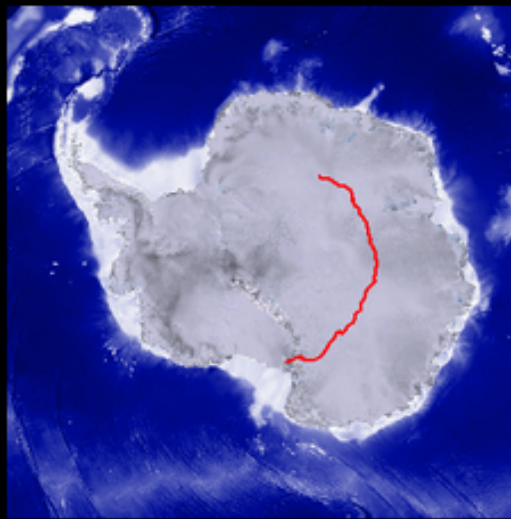
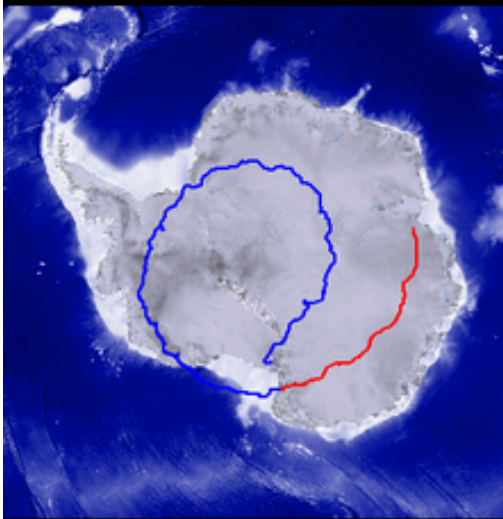
Current Revolution in Red

ANITA III

ANITA HI-CAL
Flight 2

SPB/COSI

SPIDER



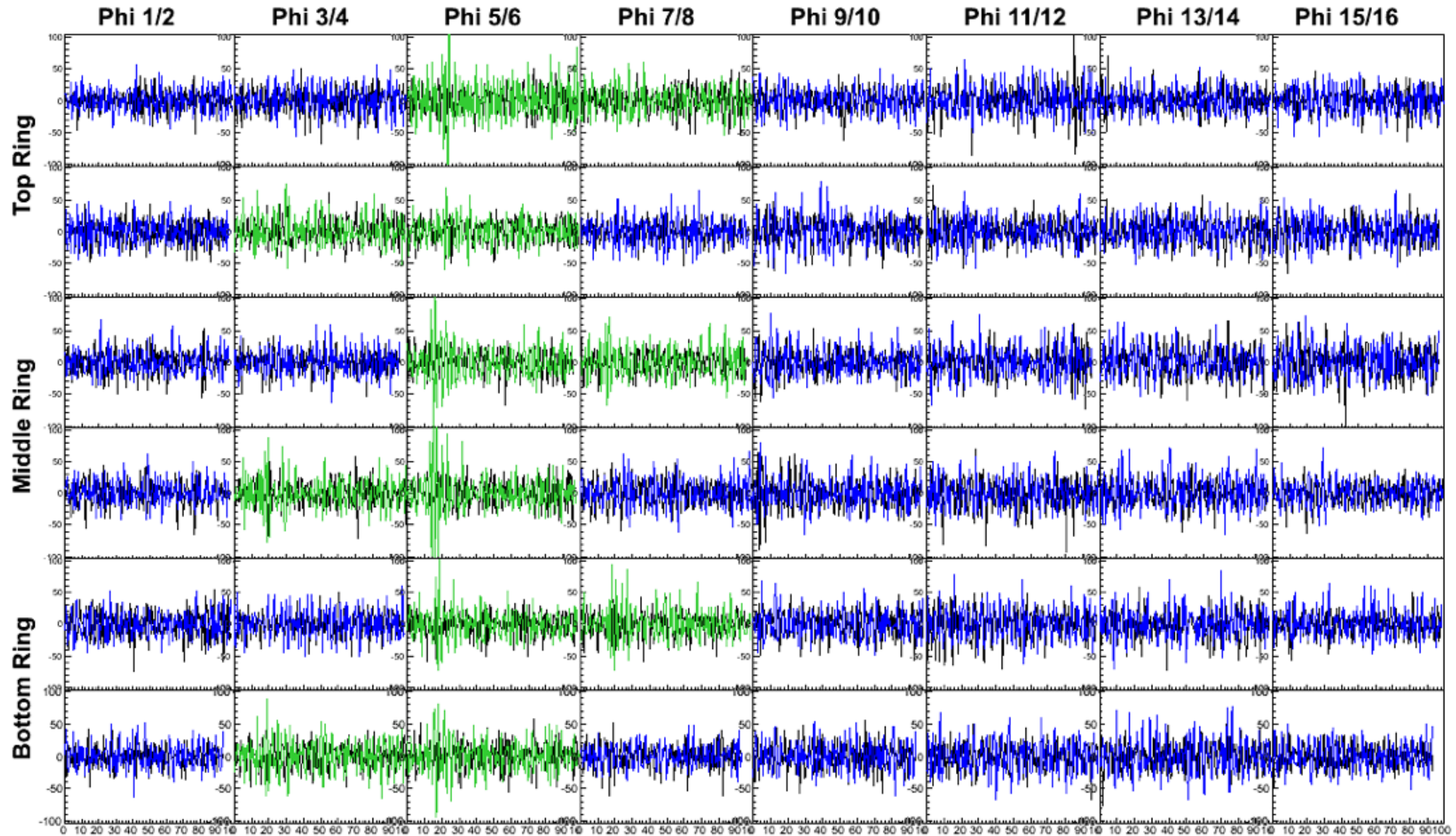
Event 1-HiCal observed from 750 km!

Run: 413
Event: 77751633

Time: 2015-01-07 05:29:34
Trigger: 824.629576 ms
Priority: 3 -- Queue: 3

Trig Num: 7433 -- Trig Type: RF
TURF: 7442

TURF This Hold: 0
TURF Active Holds: 0x5
Labrador AAAAAAAAAAAAA
Phi Mask: V 0 - H 0



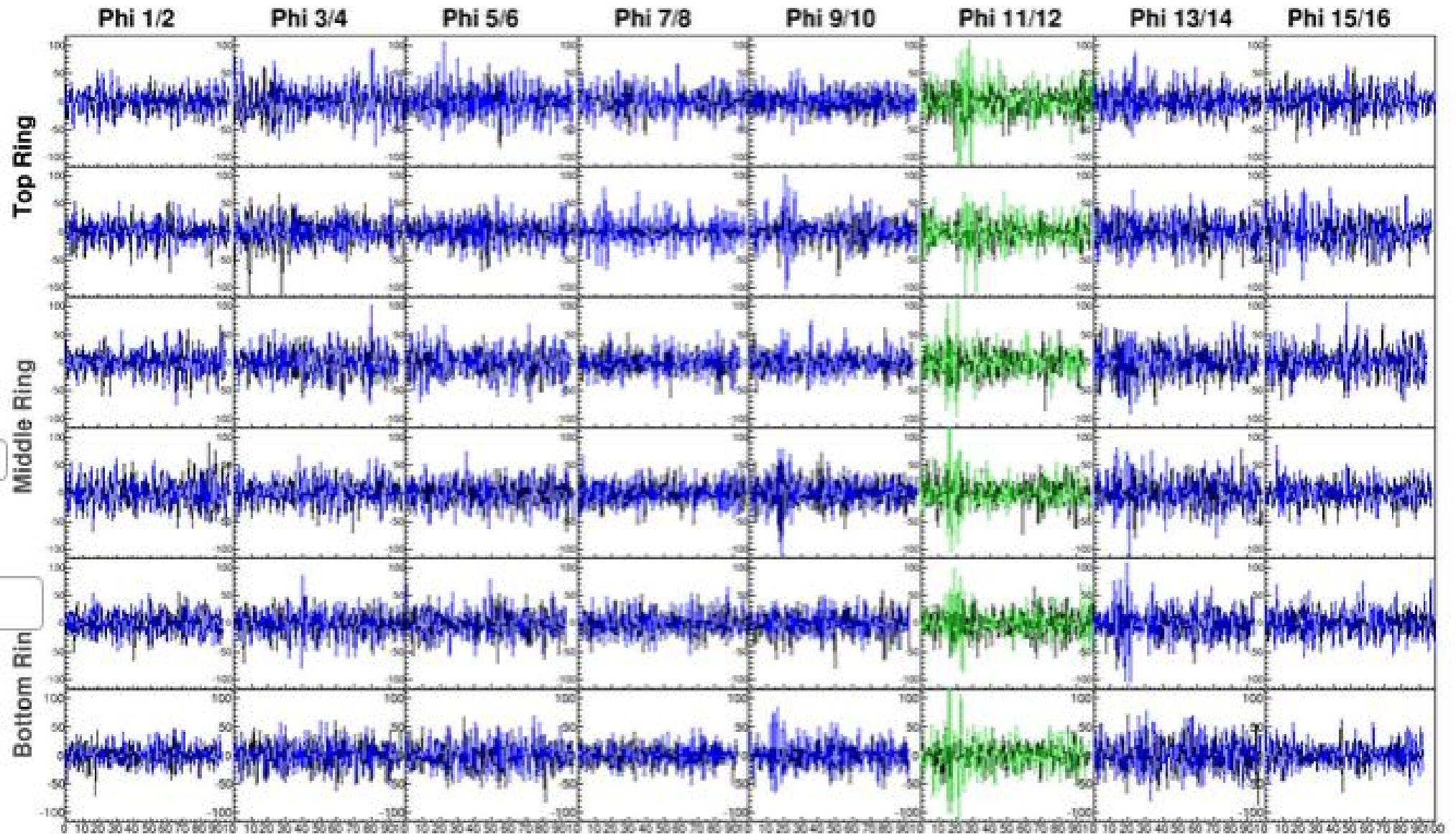
HiCal Event-2 (at float)

Event: 80016631

Priority: 3 - Queue: 3

TURP: 214444

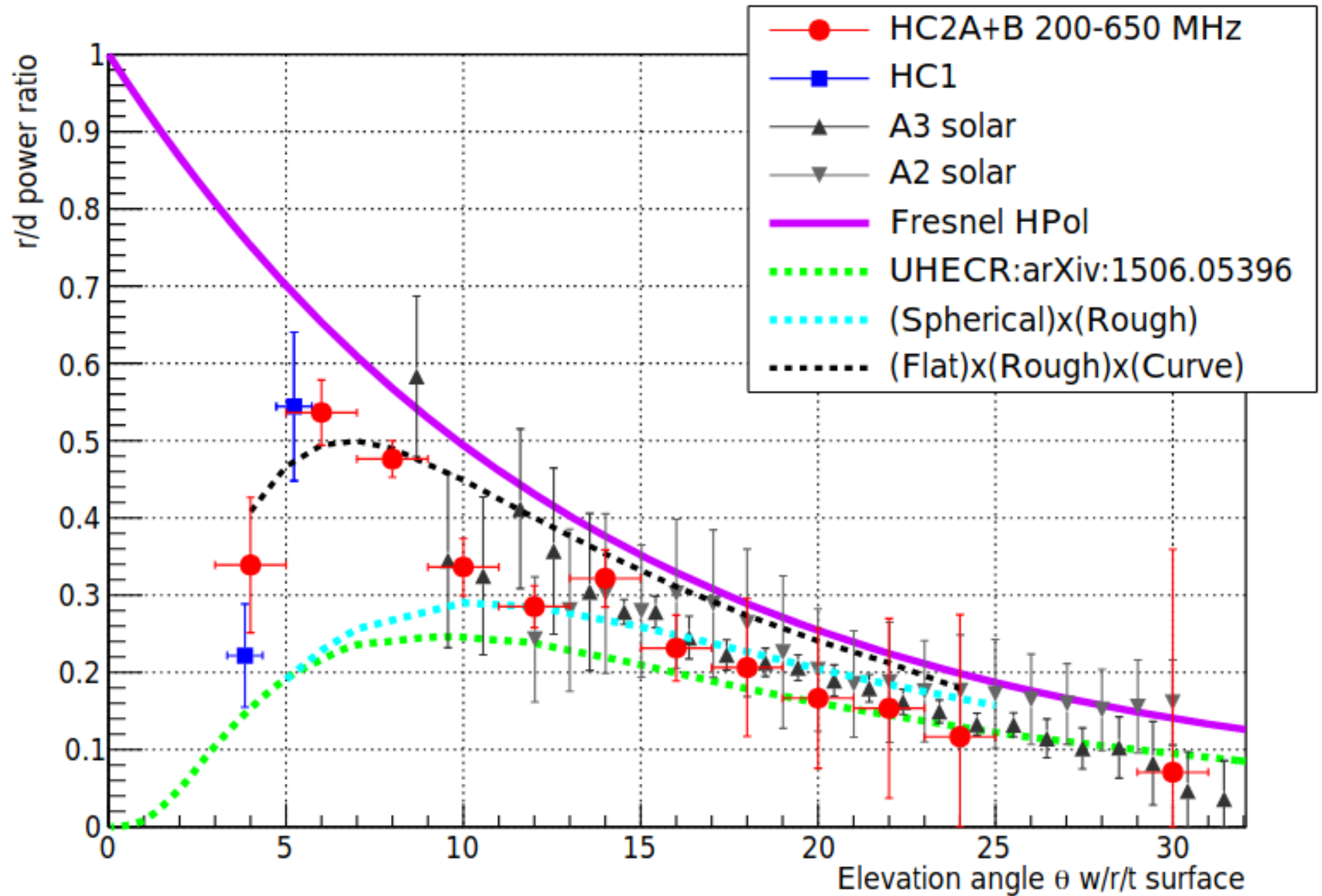
Labrador 888888888888
Phi Mask: 0



Antarctic Surface Reflectivity Calculations and Measurement and HiCal-2 Experiments

Recall partial wave expansion of incoming plane wave...

S. Prohira^f, A. Novikov^{f,r}, P. Dasgupta^a, P. Jain^a, S. Nande^a, P. Allison^{b,m},



Tau neutrinos? Must break standard model!

Possible (SM) explanations of mystery events:

- 1) Surface Roughness?
- 2) Tribo-electric effect?
- 3) Backwards-directed transition radiation?
- 4) Sub-surface reflectors?

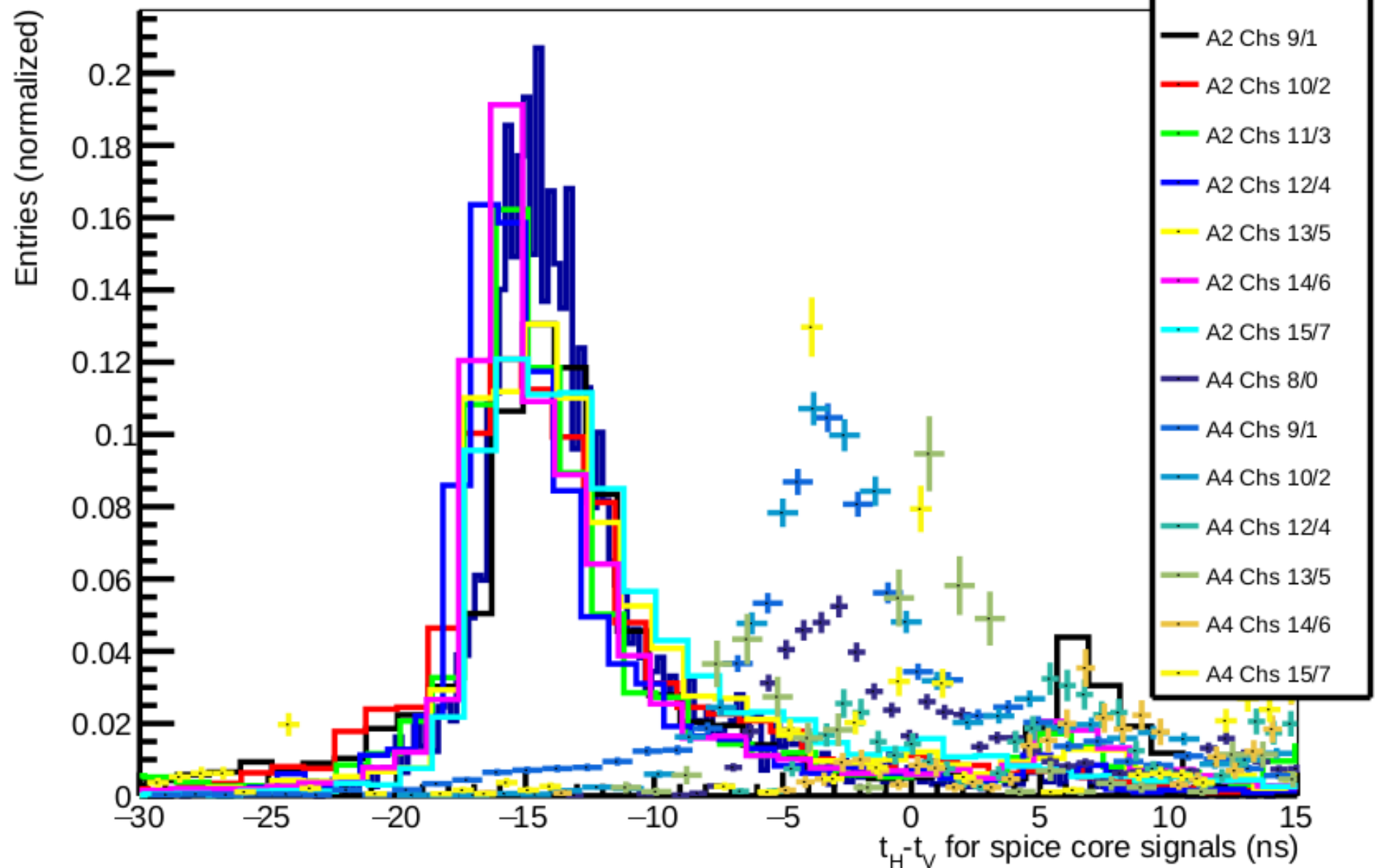
Trigger formation with a ring buffer

Design goals:

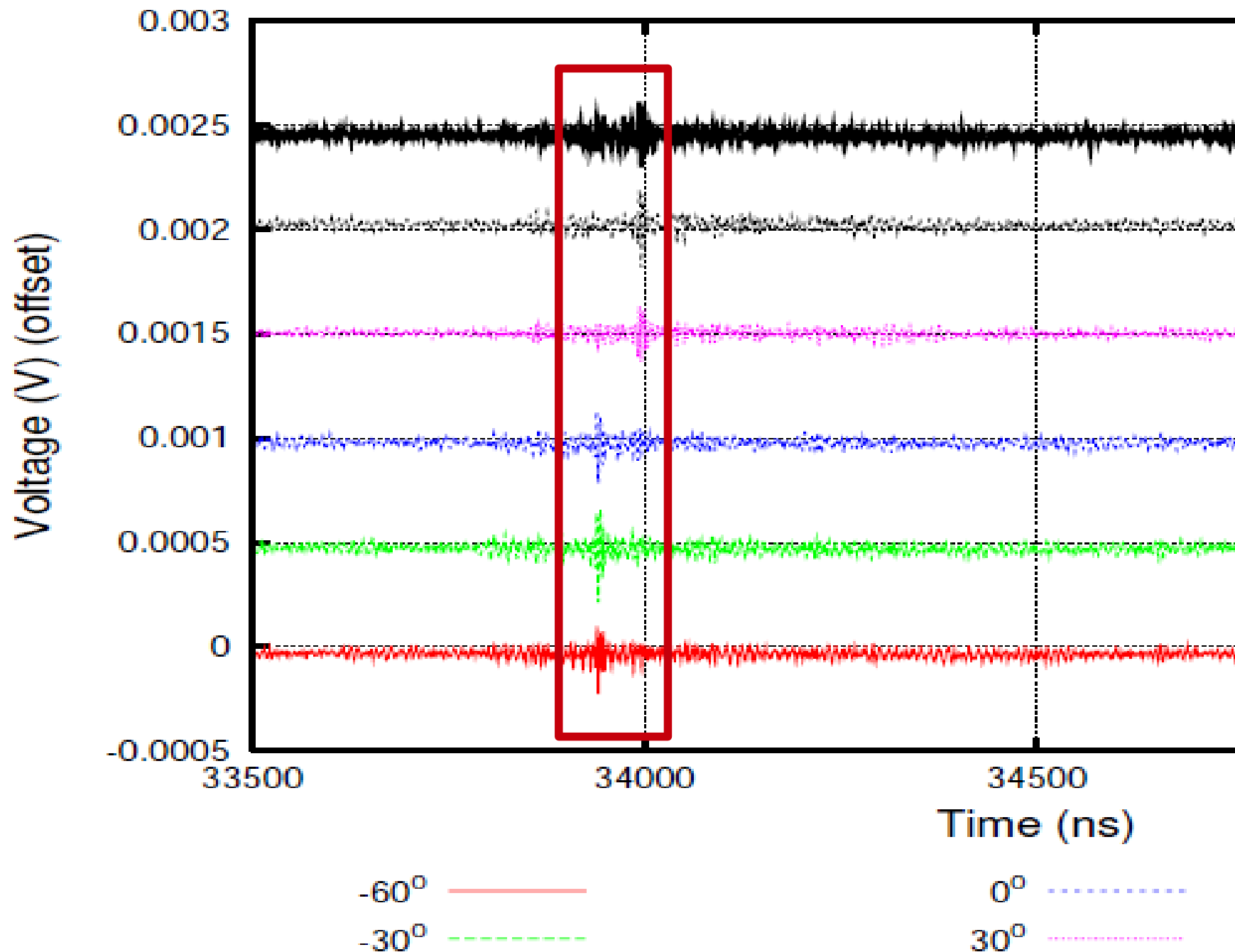
- 1) Zero deadtime
- 2) Sensitivity to linearly polarized signals of arbitrary Vpol and Hpol
- 3) Lowest possible neutrino/UHECR threshold

Birefringence! (Estimate $n_o - n_e$)

$\delta(t_{HV})$: line=A2 (\perp ice flow)/pts=A4 (\parallel ice flow)



Data on ice birefringence $V(\text{polarization})$



Can also
derive
attenuation
length from
this graph