Intersemsterial Presentation

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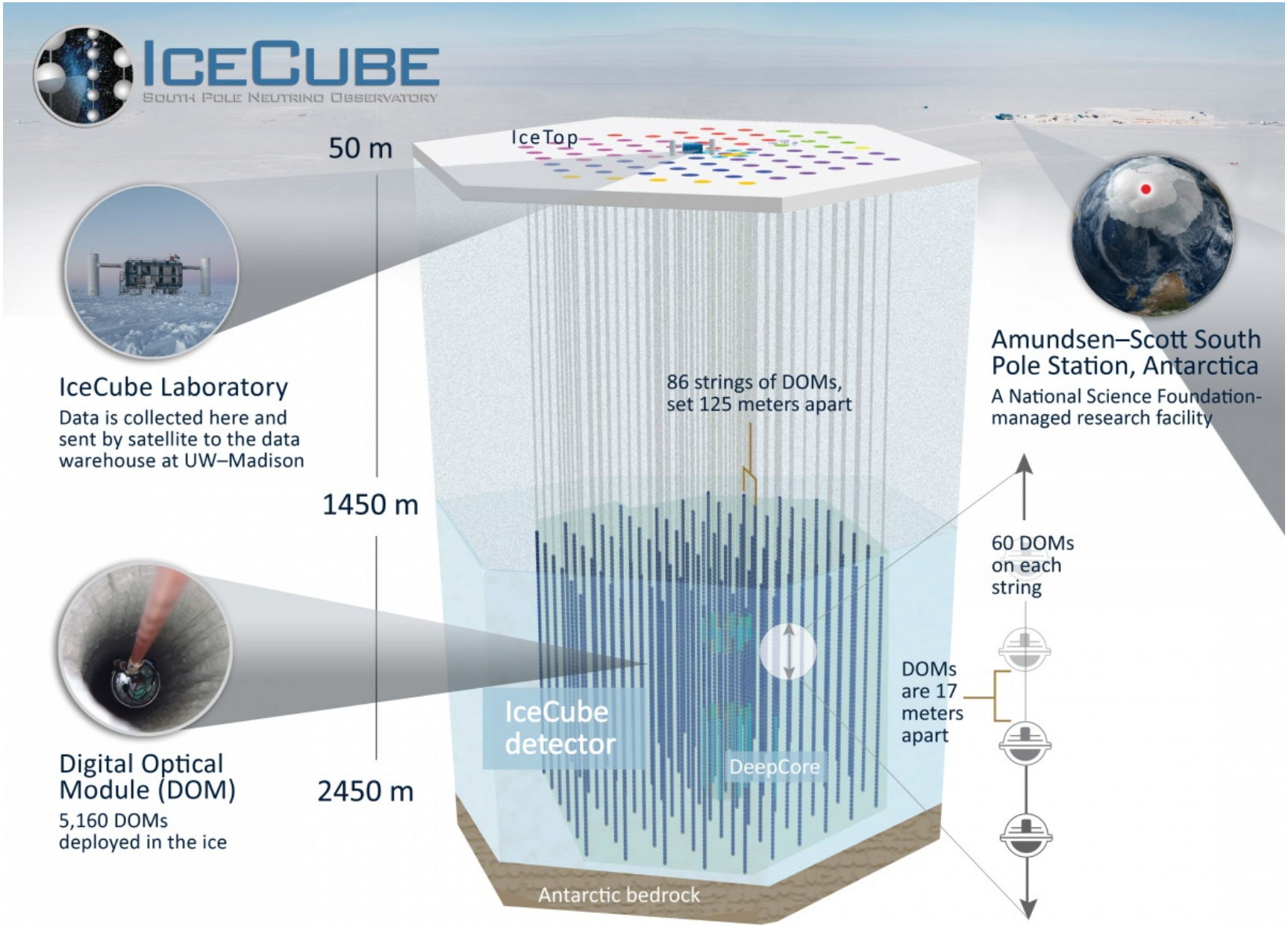
February 13, 2023

Setup

- The need for RNO-G
- RNO-G
- Ice Models
- My work

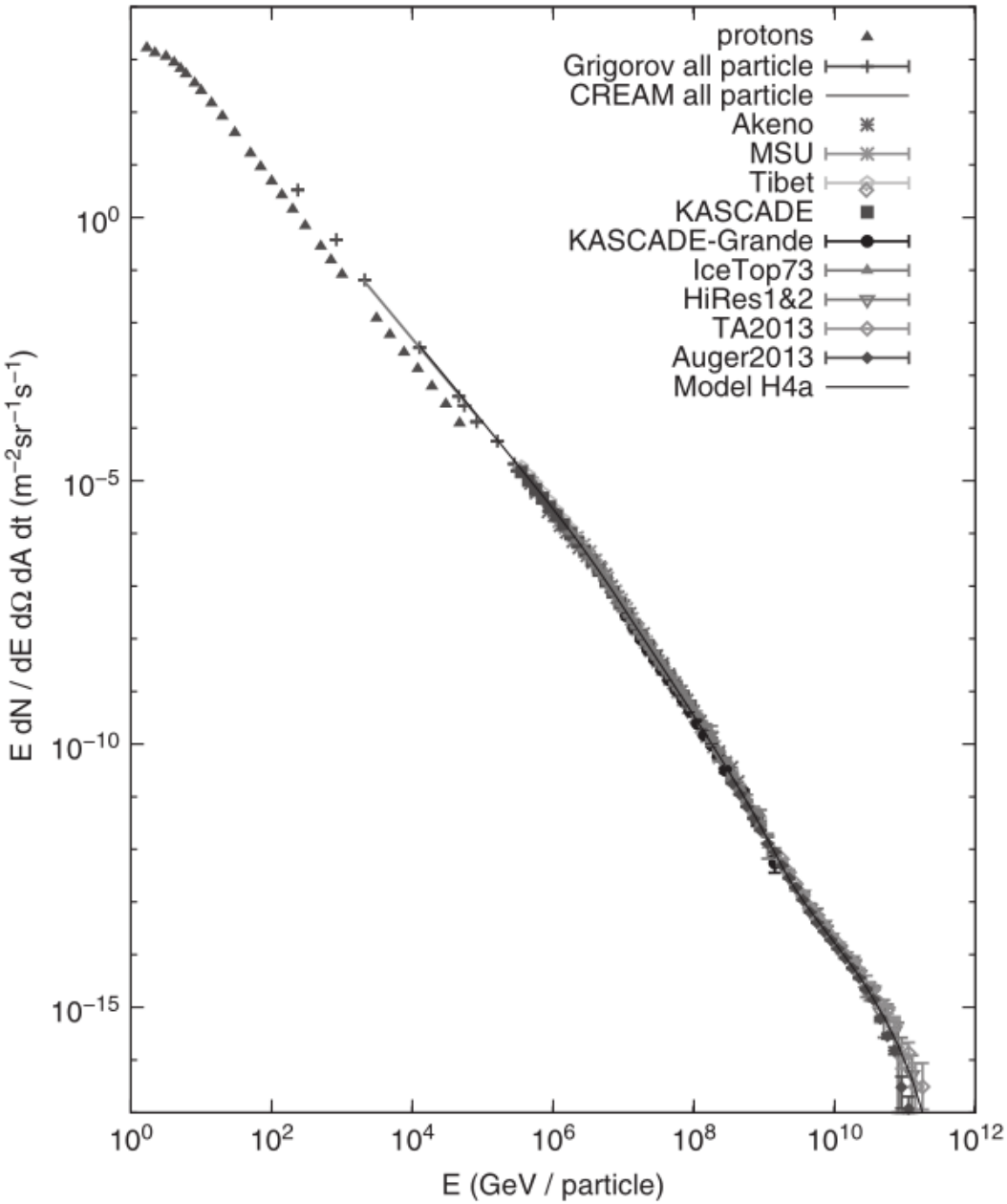
The need for RNO-G



The need for RNO-G

IceCube finds no events for energies $> 3PeV$ (*IceCube study of down-going neutrinos for the spectral cutoff determination by Palczewski and Tomasz)*

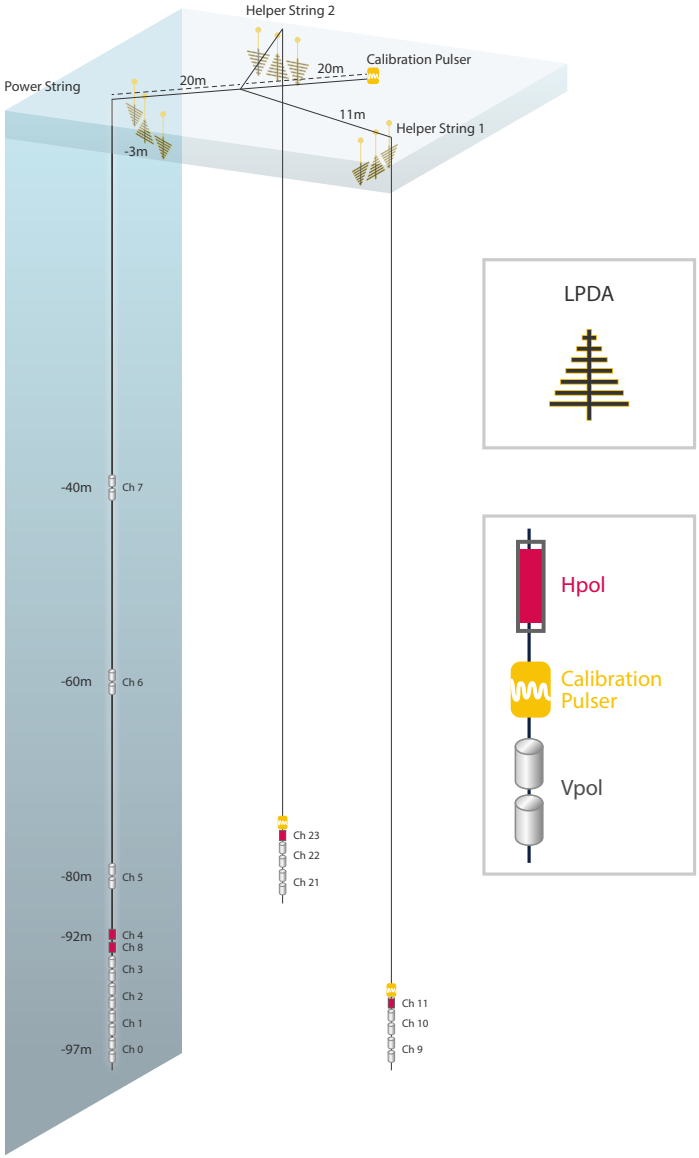
The need for RNO-G



RNO-G

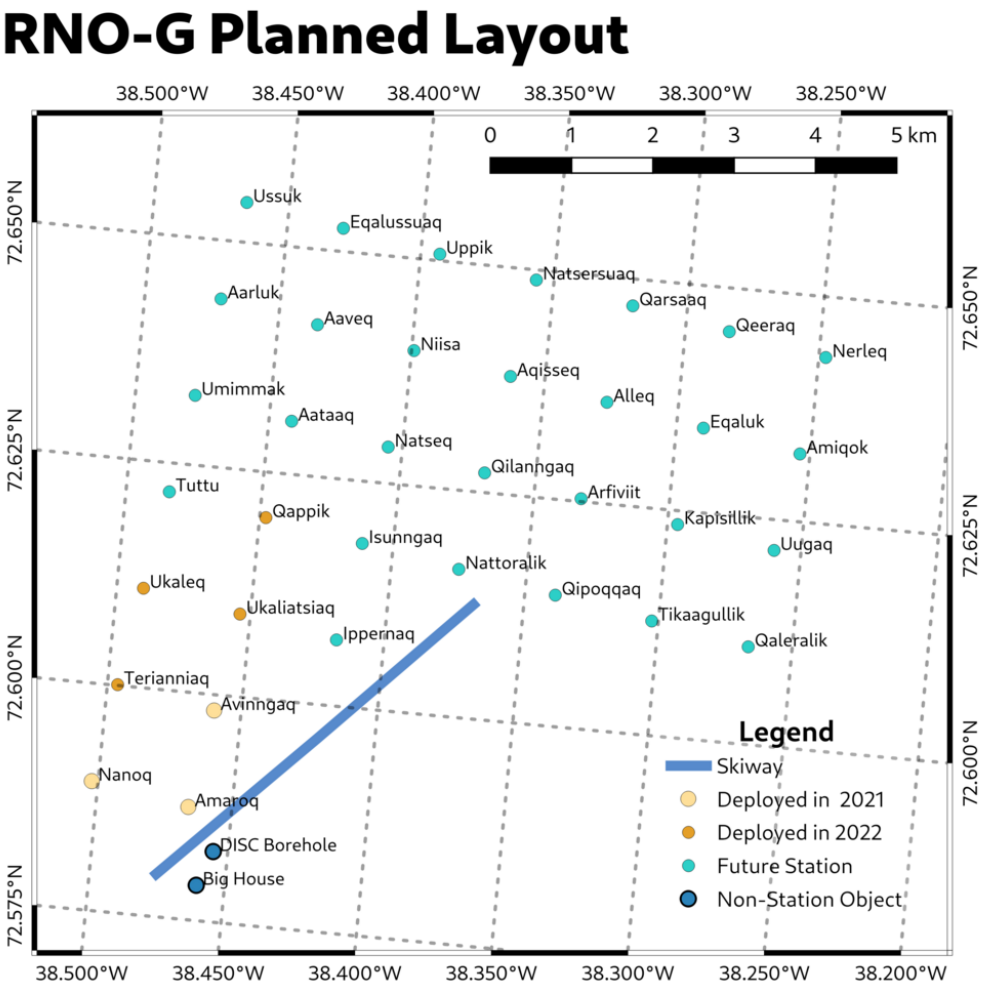
Problem: visible light doesn't travel far in ice
$\rightarrow$ Solution: radio waves

RNO-G


Helper String 2
Power String
20m
20m
Calibration Pulser
11m
Helper String 1
-3m
-40m
Ch 7
-60m
Ch 6
-80m
Ch 5
-92m
Ch 4
Ch 8
Ch 3
Ch 2
Ch 1
-97m
Ch 0
Ch 23
Ch 22
Ch 21
Ch 11
Ch 10
Ch 9
LPDA
Hpol
Calibration Pulser
Vpol

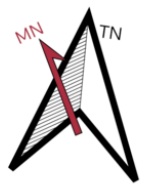
RNO-G

RNO-G



Notes:

- Station numbering follows a grid, where the first numeral is in increasing W-E and the second numeral is in increasing S-N, skipping non-existent stations (the Seckel method).
- Station spacing is 1.25 km in map coordinates (but really 1.23 km due to projection, which creates a 2% scale difference.)
- Projection is Greenland Polar Stereographic (EPSG:5938). True north indicated by Rose, offset from grid north by 5.37°.
- Magnetic Declination, for August 1 2022, is -25.2° according to the WMM.
- In list below, all future stations labeled as 2023

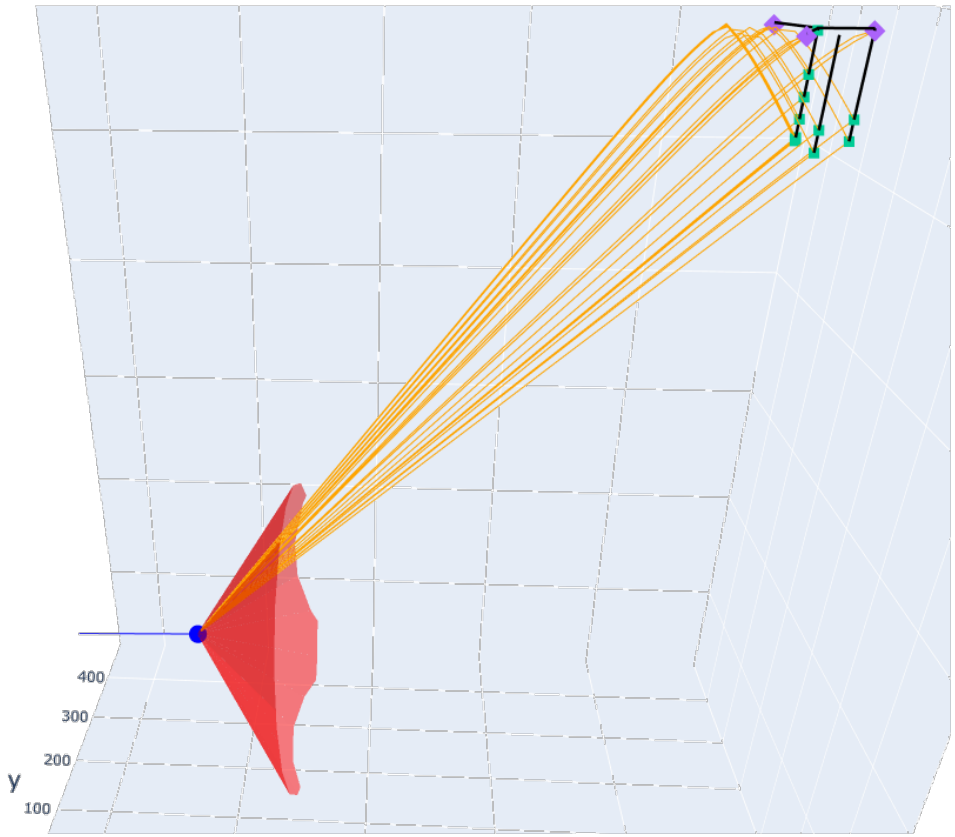


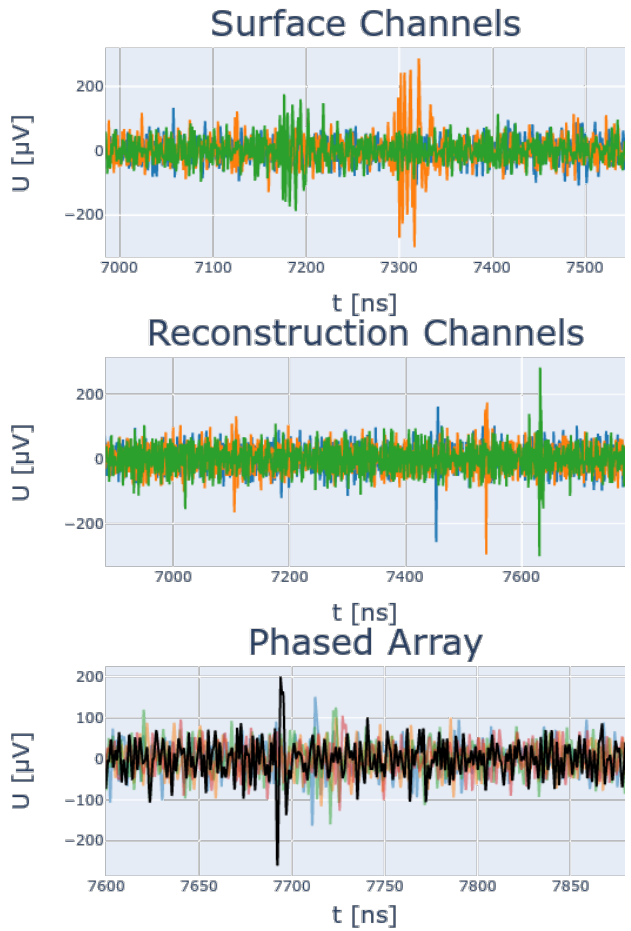
v 0.5.1

Ice Models

vertex
ray path
dipoles
LPDAs

E=2e+18eV
θ=93.3°
φ=178.8°





Ice Models

Eikonal:

$$\nabla n \approx n(\mathbf{r}) \frac{d^2\mathbf{r}}{ds^2} \tag{1}$$

Exponential model:

$$n(z) = n_0 - \Delta n \; e^{-z/z_0} \tag{2}$$