

Report and Tasks

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Big Goal

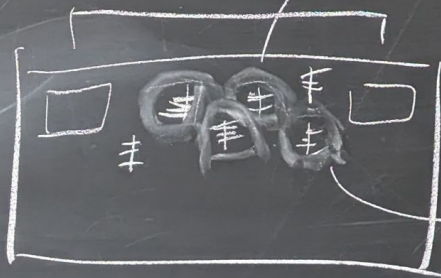
We need a factor of 10 improvement quickly

- Find a factor of ten as fast as possible
- Find a believable way to get there
- Factor of 10 “smaller” in some unit (number of antennas, array size, etc)

Ideas identified in this workshop:

- Higher gain (esp for low frequencies) antennas tuned to the horizon
- Followup with lower frequencies; higher frequency may be useful for reconstruction
- Phased “stations” at lower energy to lower energy threshold
- “Simple” antennas for reconstruction / RFI rejection
- Lower elevation and/or additional mountain targets better for lower energies, but still point towards the horizon

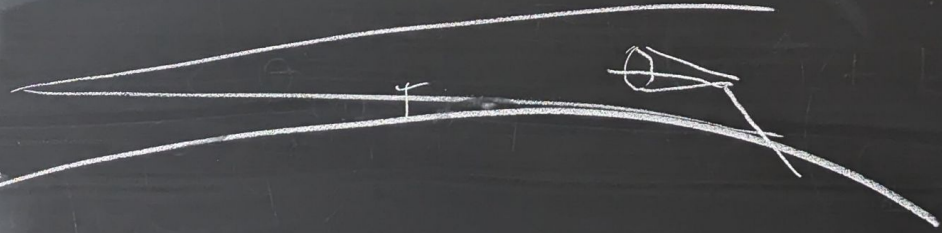
5 km?



1ns synchronized, 500 ms buffer,
externally triggered

Yagi/high-gain antennas (LPDAs?)

1-2
km?



Science Tasks

- Forecasts on discovery potential/number of events detectable depending on neutrino production models: using Mauricio's pipeline developed for Gen2-Radio
→ Rafa+Mauricio+Valentin+Kumiko
- transient population densities vs FoV
- Derek: Test the flux of a “conservative” extrapolation of the IceCube flux

Simulation Tests

- Redo BEACON simulation study with updated numbers on low-frequency background noise and higher-gain antennas
→ Andrew/Stephanie
 - ideal noise temperature is 300 K
 - higher-gain antennas (Yagi-Uda maybe 15 dB reachable, but maybe only 10% center-frequency bandwidth)
 - probe also a frequency band around 100-200 MHz
 - redo at different elevations (?)
 - redo with different spacings (to determine spacing needed)

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Simulation Tasks

- Performance study of ideal toy model detector - parameter scan (# of stations, # antennas in stations, distances between units, size, elevation, ...)
 - Austin+Aurelien+Valentin+Kumiko
 - Aperture % achieved
 - Number of antennas
 - Number of stations (x channels)
 - Elevation
 - Energy threshold achievable
 - At what energy / parameters are you limited by the exit probabilities?
 - Topography
 - Energy threshold effects
 - It will probably always be an improvement, can thus be left for later if needed
 - Important to find plausible sites, and then consider their particular topography
 - Instantaneous field of view on the sky
- Hierarchy of effects that prevent access to low energies (tau exit probabilities, etc. → effects listed in Austin&Valentin's slides)
- What do interspersed single unphased antennas that are phased up in analysis contribute to reconstruction and RFI rejection? Are they worth the effort of deployment?
 - How many are needed and where relative to the phased stations?

Technological Tasks

- Field test of whether pointing Yagi antenna to the ground reduces noise power as hoped for.
→ Tim/Andres in Argentina? Kathryn in OVRO?
- Research into possible low-frequency high-gain antennas
→ Tim
- Compare assumed array designs to real options for sites
→ Kumiko