

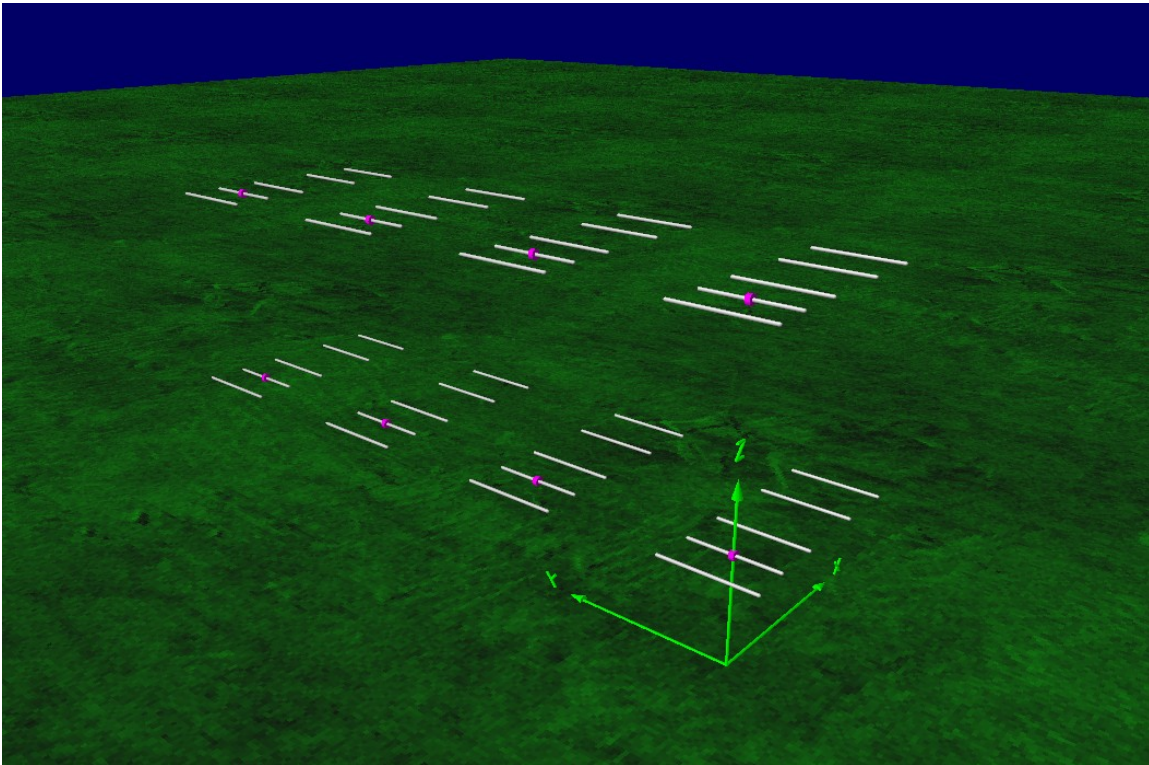
## Explanation of Proposed Changes/Amendments to Experimental License WF2XZZ

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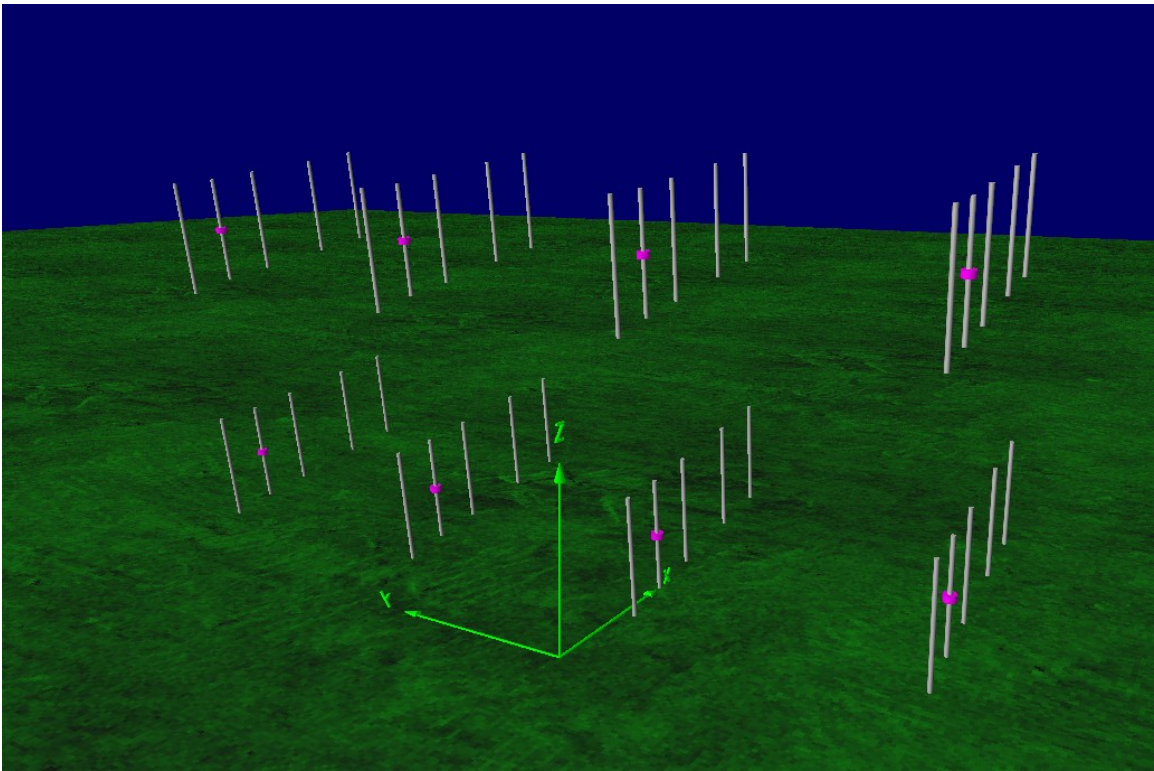
A detailed description of our research goals has been submitted as a previous exhibit. These goals haven't changed. To recap, we seek to determine if radar detection of cosmic rays (CR) is a viable detection method. Specifically, can cosmic ray radar be used to determine key parameters: CR energy, geometry and possibly depth in atmosphere of shower maximum.

Our first ~1.5 years of experimental data suggest our sensitivity will be increased if the antenna polarization is aligned with the CR shower axis. Due to interactions with the atmosphere, there are fewer showers that reach the detection area with high incidence angles (relative to the normal to the earth's surface). Therefore, we expect slightly more showers to have low incidence angles. Our experiment will benefit from a vertically polarized transmitting antenna, instead of the horizontally polarized antenna we currently use.

Before we finalized plans for our current phased Yagi array (eight antennas total, two rows by four columns), we anticipated that one polarization might be preferable to another. We included in the design the ability to change antenna polarization with minimal effort. Illustrations 1 and 2 show perspective sketch of the current antenna and proposed vertically-polarized antenna that will result when we rotate each Yagi through an angle 90 degrees.



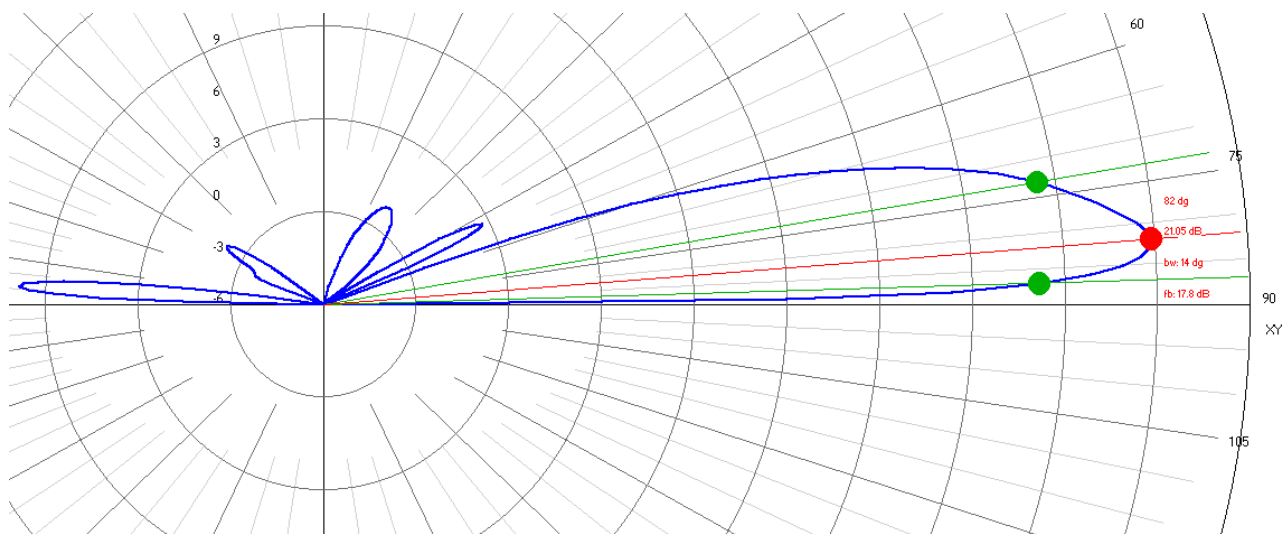
*Illustration 1: Current WF2XZZ transmitting antenna sketch.*



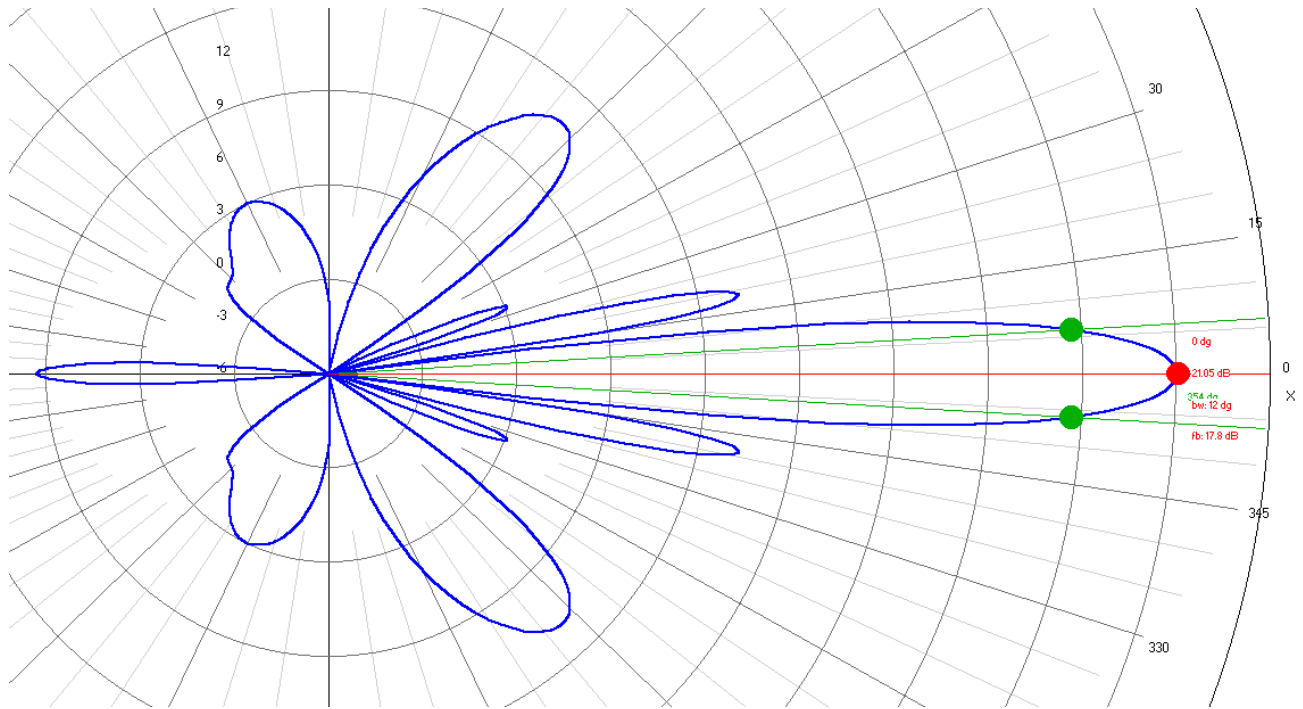
*Illustration 2: Modified vertically-polarized WF2XZZ transmitting antenna sketch.*

The only change we will make to the current antenna beside rotating each Yagi is to give each Yagi an eight degree elevation angle because there will be no ground effect in the vertical polarization. Current antenna elevation angle is zero, parallel to the ground. Antenna location, transmitter, transmitter power, transmission line, frequency (54.1 MHz) and emission (N0N) all remain the same.

Illustrations 3 and 4 show the simulated radiation pattern for the modified vertically-polarized antenna.



*Illustration 3: Modified WF2XZZ vertically-polarized antenna vertical radiation pattern.*



*Illustration 4: Modified WF2XZZ vertically-polarized antenna azimuthal radiation pattern.*