CURIE: ANTENNA DESIGN

1. *Dipole at 2.4GHz:* Design of 45° angle Dipole Antenna. Dipole element length of 7.272cm for operation at 2.4GHz. Simulated bandwidth (-3 dB) of 959.5 MHz and Realized Gain of 5.352 dB (Directivity of 5.457 dBi). Front-to-Back Ratio of 6.912.

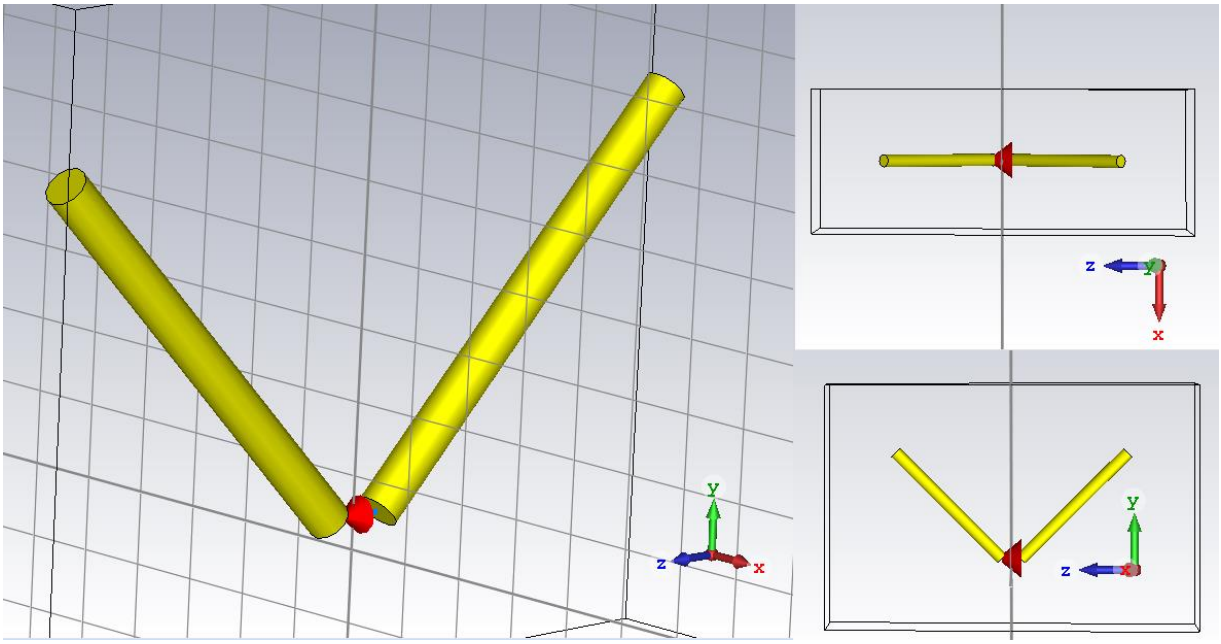

Figure 1.1. 45° Dipole Antenna. Design and Simulation performed with CST Studio Suite 2017 ©.

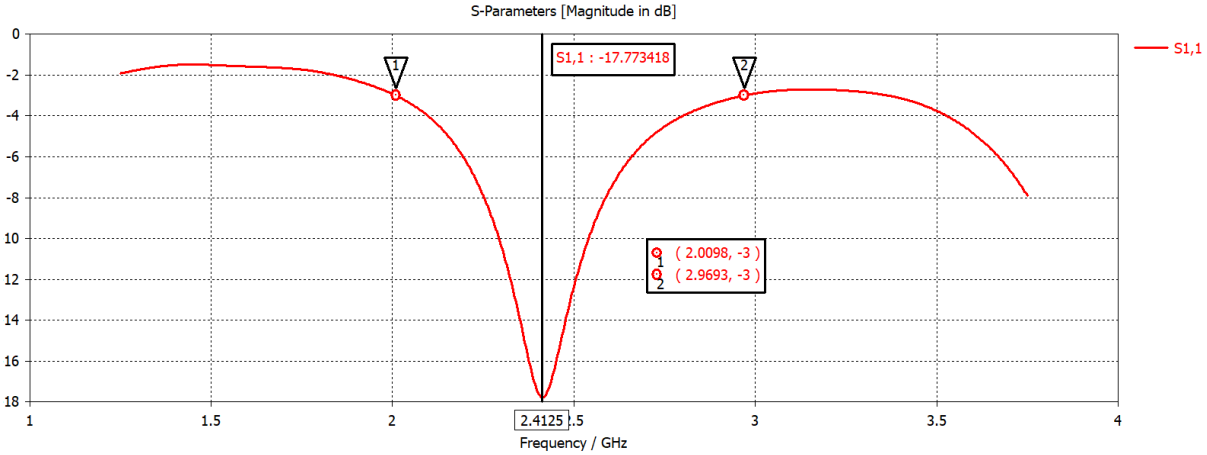

Figure 1.2. Input Reflection Coefficient for 45° Dipole Antenna. Design and Simulation performed with CST Studio Suite 2017 ©.

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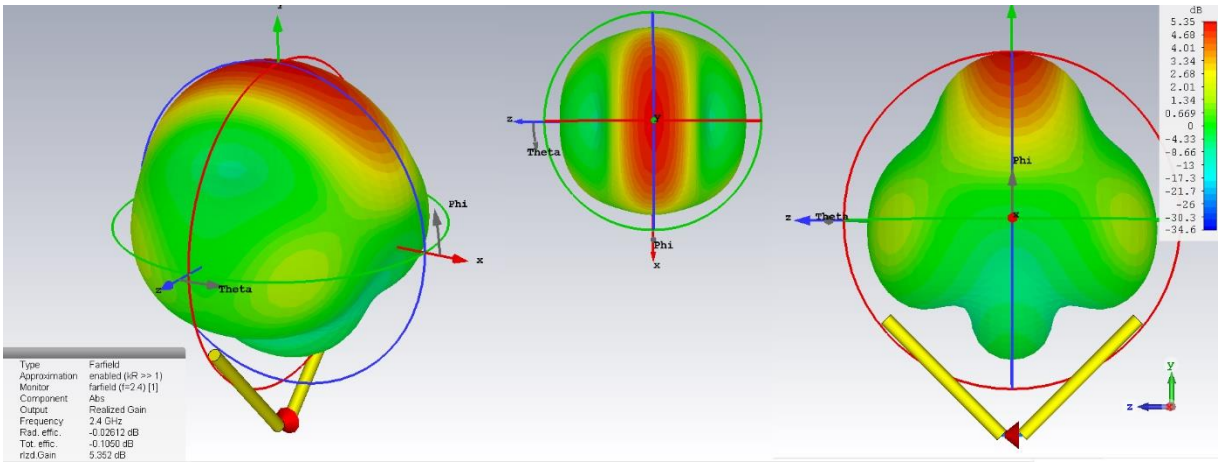

Figure 1.3. Farfield Radiation Pattern for 45° Dipole Antenna. Design and Simulation performed with CST Studio Suite 2017 ©.

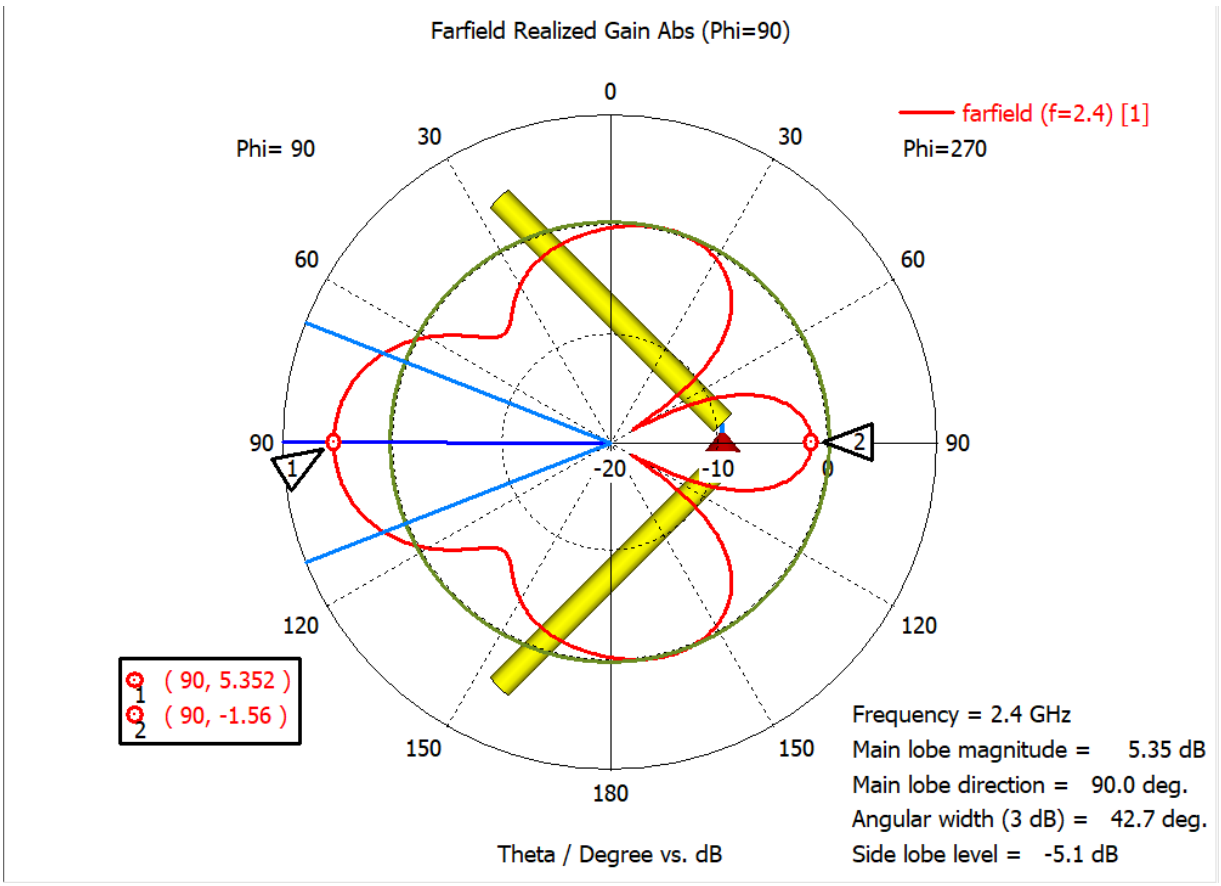

Figure 1.4. Farfield Radiation Pattern for 45° Dipole Antenna – Polar Plot. Design and Simulation performed with CST Studio Suite 2017 ©.

When adding the 45° angle Dipole Antenna to the back of CubeSat structure, with an additional 45° inclination with respect to the back side of the Cube, antenna behavior is altered. Operation is now shifted down in frequency to 2.1GHz with an estimated bandwidth (-3dB) of 670MHz, and a Realized Gain of 3.9 dB. Simulation performed without 2.4m Wire Antennas at the opposite (front) side of CubeSat structure.

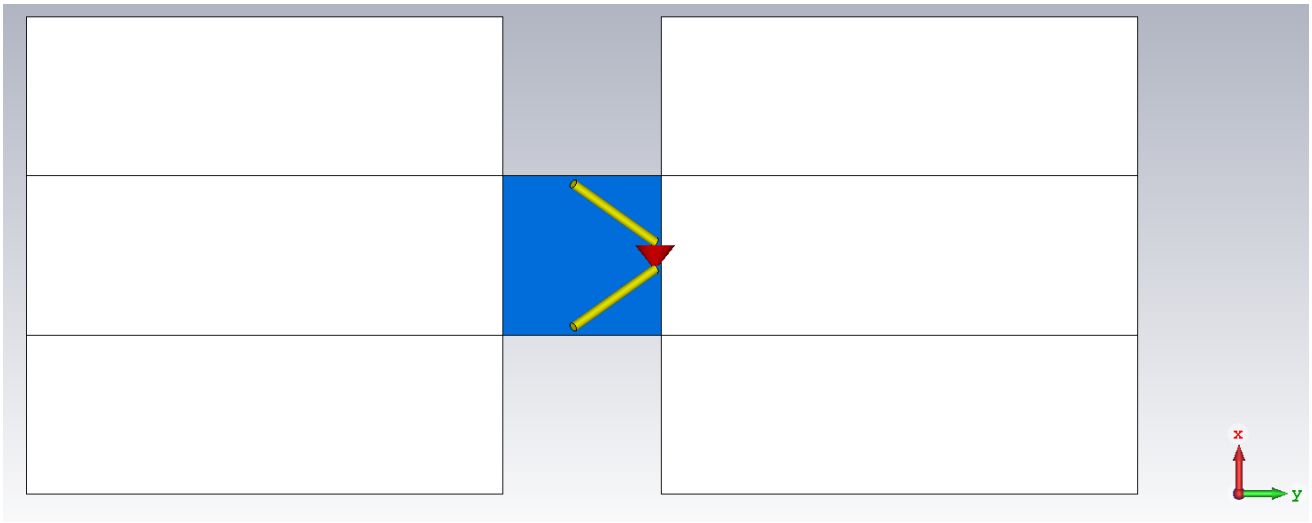

Figure 1.5. 45° Dipole Antenna on Backside of CubeSat structure. Design and Simulation performed with CST Studio Suite 2017 ©.

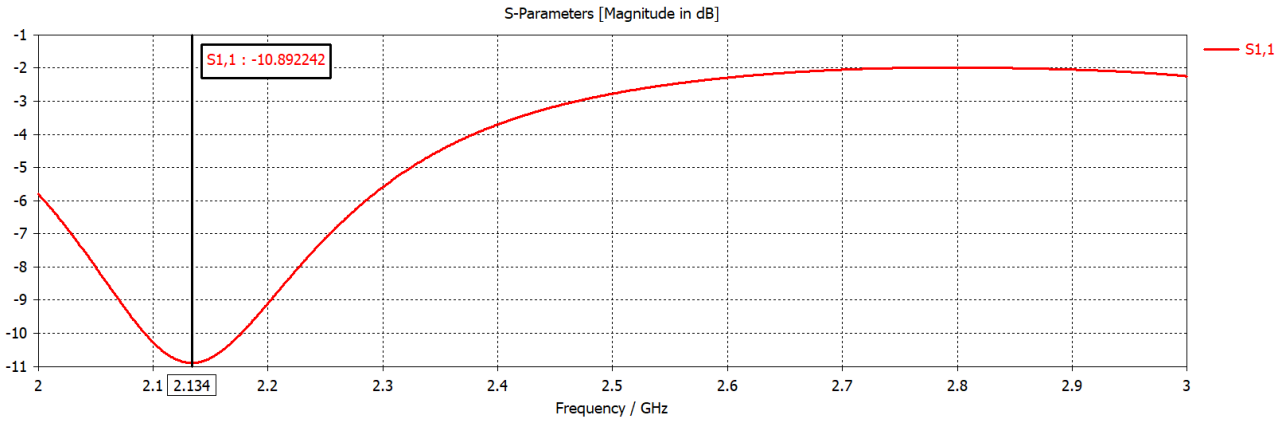

Figure 1.6. Input Reflection Coefficient for 45° Dipole Antenna on Backside of CubeSat structure. Design and Simulation performed with CST Studio Suite 2017 ©.

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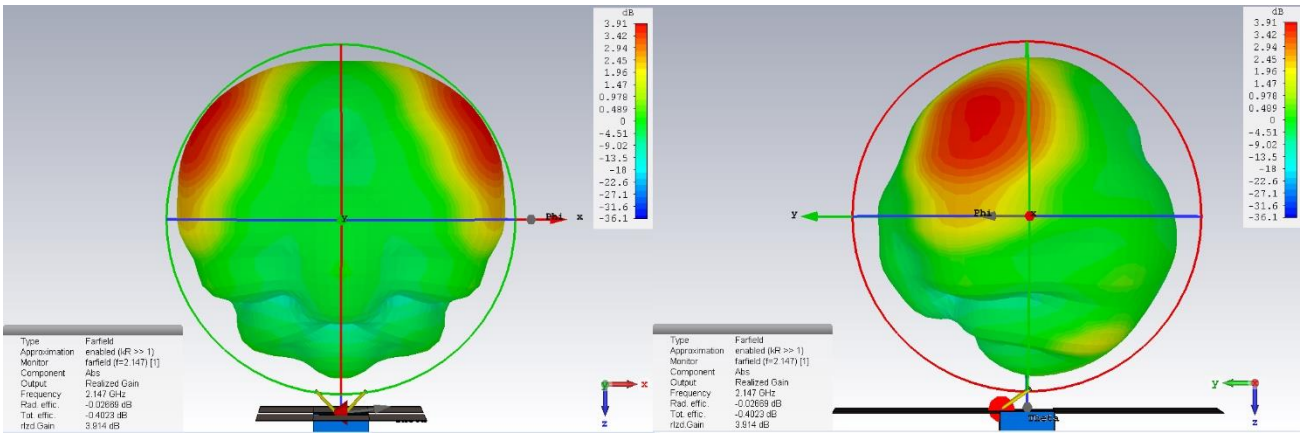

Figure 1.7. Farfield Radiation Pattern for 45° Dipole Antenna on Backside of CubeSat structure. Design and Simulation performed with CST Studio Suite 2017 ©.

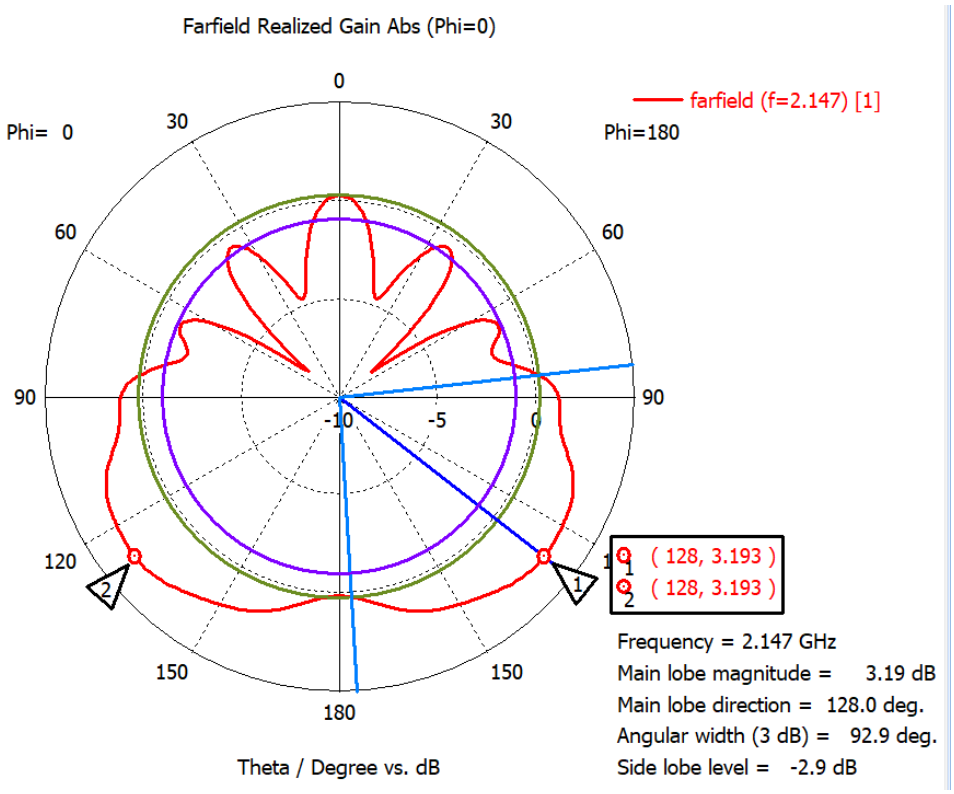

Figure 1.8. Farfield Radiation Pattern for 45° Dipole Antenna on Backside of CubeSat structure – Polar Plot. Design and Simulation performed with CST Studio Suite 2017 ©.