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Consideration of end-fed antenna
Impedance characteristics when feeding at one end of antenna wire

1. Introduction

When designing and manufacturing an end-fed antenna, it is known that feeding power from one end of the antenna wire results in high impedance, but reliable data on its characteristics is not available, so I tried measuring it using my antenna analyzer.

First, attach the conversion connector to the antenna analyzer RigExpert AA-55 ZOOM. The measurement plane was set using OSL (Open-Short-Load) calibration. Next, connect the wire to the conversion connector to obtain frequency, resistance, and reactance data, and once the data is saved in the AA-55. Finally, I used the AntScope2 app to download it to my computer and draw each graph.

When a 266cm antenna wire is installed perpendicular to the ground, the resonant frequency (frequency when inductance = 0) was 51.0MHz, and the resistance around that frequency was 2500-3000Ω.

2. Test product and measurement system

(1) Measuring equipment and calibration status

Photo 2.1 shows an overview of the sample and the status of calibration.

(2) Measurement implementation status

Photo 2.2 shows the measurement implementation status.

Photo 2.1
Test product and calibration status

Photo 2.2
Measurement implementation status

3. Measurement result

Figure 3.1 shows the measurement results in the frequency range 45-55MHz. In Figure 3.1, the lower left graph shows the resistance, the lower right graph shows the reactance, and the upper right graph shows the impedance calculated from them. Note that the measurements were performed six times in the same format, and the data for the six measurements were overwritten.

When feeding power to a 266cm antenna wire from one end, the resonance frequency (reactance = 0) is 51.0MHz, and the resistance (radiation resistance) around that frequency is 2500 to 3000Ω.

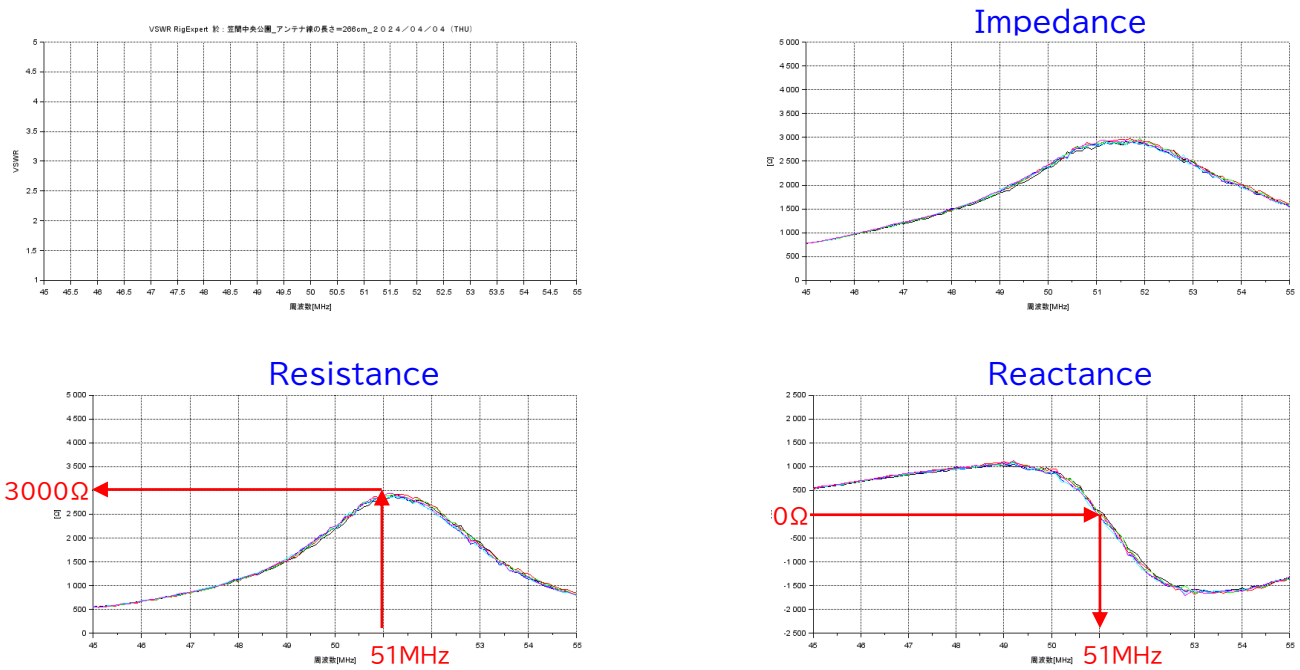

図 3.1 Measurement result

4. Afterword

This time, I measured the impedance characteristics when feeding power from one end of the antenna wire.

As a result of measurements, it was found that when the antenna wire is installed perpendicular to the ground, the resistance component near the resonance frequency is 2500 to 3000Ω.

In the future, I will design an LC circuit that matches this high impedance with the transmitter's output impedance of 50Ω.