## EE 483L/583L Antennas for Wireless Communications (Spring 2025)

## Laboratory 10

## TV Station Information and Yagi-Uda Antenna Receiving Characteristics

**Background** (Thursday May 1, 2025 on EEP roof; backup day Friday May 2, 2025)

For this lab, you or your team will find some information about the local UHF television (TV) station for which your Yagi-Uda antenna was designed, built, and matched. Weather permitting, you will take selected measurements using the TV station as the far field source for your antenna.

**UHF TV Station Information** (Give sources for each answer. Hint: Use internet &/or FCC.)

1. Call sign (e.g., KELO) \_\_\_\_\_\_\_\_\_\_\_\_\_
2. Over-the-air transmit channel (e.g., 12, 28, …) \_\_\_\_\_ & frequency range \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Effective Radiated Power (ERP) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Location latitude \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ & longitude \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Street address/location (e.g., Cowboy Hill, Skyline Dr., etcetera) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Antenna Measurements** (use your antenna & power meter)

1. Maximum measured power received *P*max = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. Polarization of received signal- Linear or Circular? (circle correct answer)
3. If linear polarization, Horizontal or Vertical? (circle correct answer)
4. With antenna oriented for *P*max, rotate antenna 90° about the boom, i.e., swap horizontal ↔ vertical polarization, and measure the received power *P*max,90° = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
5. Starting with antenna oriented for maximum received power, rotate yourself & antenna 180°, i.e., point opposite direction, and measured received power *P*back = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
6. Measure the maximum received power for the closest local UHF station NOT at your design frequency *P*max,adj = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .

Comments:

**Antenna Parameters** # elements = \_\_\_\_\_\_  *G*design = \_\_\_\_\_\_\_\_\_\_\_

1. Compute normalized received power (in dB), *P*norm = *P*max - *G*design = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. Compute cross-polarization (in dB), CP = **-**⏐*P*max - *P*max,90°⏐ = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. Compute front-to-back ratio (in dB), FB = *P*max – *P*back = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Comments:

**Due Friday May 2, 2025 at class or end of day.**