

## EEE414: Mobile Communications

### Propagation assignment suggested layout

*please clearly label on the 1<sup>st</sup> page:*

EEE414: Mobile Communications

Propagation assignment

name:

ID number:

#### **Abstract:**

3 or 4 sentences summarizing the entire document

#### **Introduction:**

Very brief introduction to indoor & outdoor propagation & relevance to mobile communications. Refer to *Sommer*, *Rappaport* & some other references. Chinese language references are accepted. Explain the 2-ray interference model. What are the effects of polarization?

Describe the types of measurements undertaken in the anechoic chamber & CG13W. Explain the choice of these rooms. What distance above the floor was used? What equipment was used?

#### **Antenna Gain calculation:**

Use *Balanis* equation 17-15 to calculate the Gain of both antenna types from the data measured in the anechoic chamber. Compare to the FEKO™ simulation results given in Lecture 2 slides 56 & 57.

Were any of the data measured within the near field zone of either antenna type? What was the effect, if any?

**Effect of end reflections:**

Compare measured V-V beer can antenna data from 2019/09/26 and 2019/10/17. The latter measurements had an absorber barrier at the far corner of room CG13W. Did it have any effect?

**Beer can antenna data:**

Measured data from 2019/10/17 and 2019/10/31 were done with the beer can antennas, with the absorber barrier at the far corner of room CG13W. What was the difference between the V-V & H-H datasets? How do these measured results compare to the predictions from the 2-ray interference theory & the FEKO™ simulation results? Were there any significant differences between the 3 for V-V and H-H? Can you determine the relative permittivity  $\epsilon_r$  of the floor?

**Short Backfire antenna data:**

Measured data from 2019/11/14 and 2019/11/28 were done with the Short Backfire cake tin antennas, with the absorber barrier at the far corner of room CG13W. What was the difference between the V-V & H-H datasets? How do these measured results compare to the predictions from the 2-ray interference theory & the FEKO™ simulation results? Were there any significant differences between the 3 for V-V and H-H? Can you determine the relative permittivity  $\epsilon_r$  of the floor?

**Conclusions:**

Conclusions on agreement & differences between the theory, simulation & measured data. How do your 4 estimates of the floor relative permittivity compare? Any other observations on the entire exercise.