

## 안테나 측정, Problem Set 2, Solutions

1.

← voltage (or electric field)

$S_{11}$ : reflection coefficient of antenna #1 with antenna #2's port terminated with a matched load

$S_{12}$ : transmission coefficient from antenna #2 to antenna #1

$S_{21}$ : transmission coefficient from antenna #1 to antenna #2

$S_{22}$ : reflection coefficient of antenna #2 with antenna #2's port terminated with a matched load

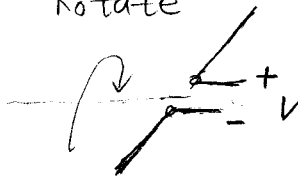
2.



AUT

(antenna under test)

Rotate



a. Place a rotating dipole in the far-field region of an AUT. The dipole axis is parallel to the plane of the AUT aperture

b. Continuously measure the dipole's received voltage while rotating the dipole with the dipole axis always parallel to the plane of the AUT aperture.

c. The axial ratio (AR) of the AUT is obtained from

$$AR = \frac{|V|_{\max}}{|V|_{\min}}$$

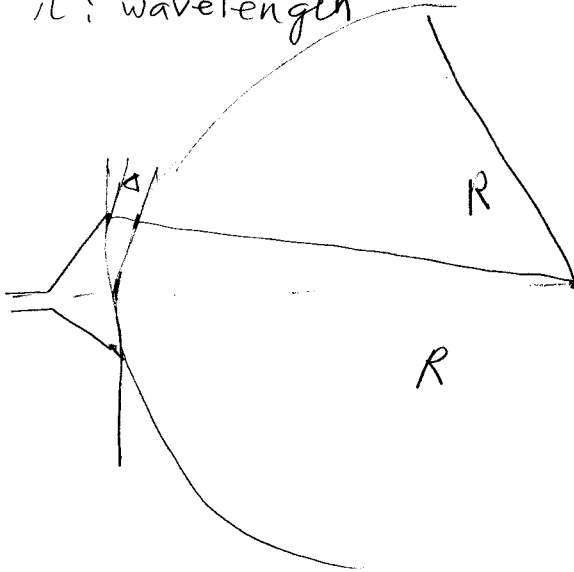
3.

$$1) R \geq \frac{2D^2}{\lambda} = R_{ff}$$

$D$ : antenna aperture maximum dimension

$\lambda$ : wavelength

2)



$$\Delta \leq \frac{\lambda}{16}$$

$$k\Delta \leq 2\pi \frac{\lambda}{16} = 22.5^\circ \text{ (max. phase error)}$$

3)

- Gain angular pattern <sup>is</sup> independent of  $R$  as far as  $R \geq R_{ff}$ .

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