Chapter 3 figs ELEN4001

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Note that the source code for the figs can be seen by clicking the pic. You will need to use your Browser's BACK button to return to this page.
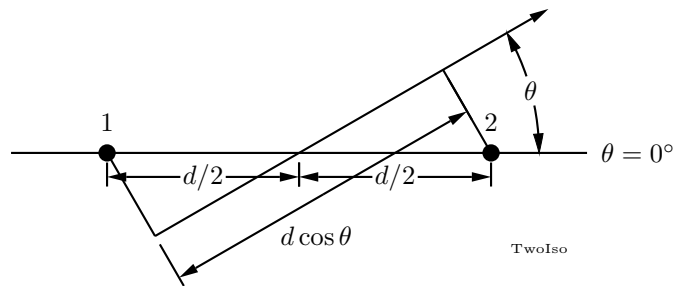
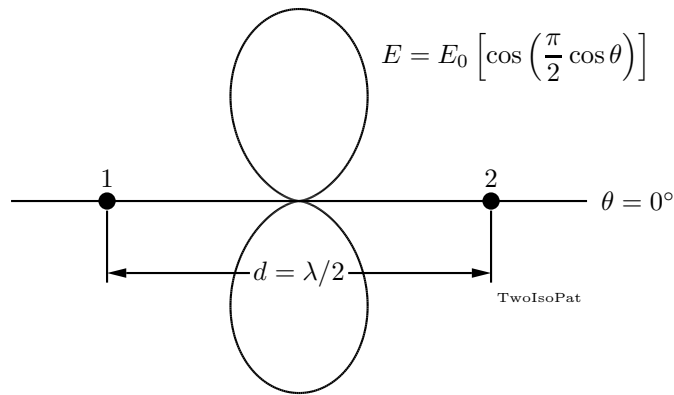

Figure 1: Two Isotropic point sources, separated by d

$$E = E_0 \left[\cos \left(\frac{\pi}{2} \cos \theta \right) \right]$$

Figure 2: Two sources separated by $\lambda/2$

$$E = E_0 \left[\cos\left(\frac{\pi}{2}\cos\theta\right)\right]$$

$$E = k\sin\alpha$$

$-\alpha$

1   2

θ

$\theta = 0°$

$$E = E_0 \left[\cos\left(\frac{\pi}{2}\cos\theta\right)\right] \times k\sin\alpha$$

$d = \lambda/2$

PatMult
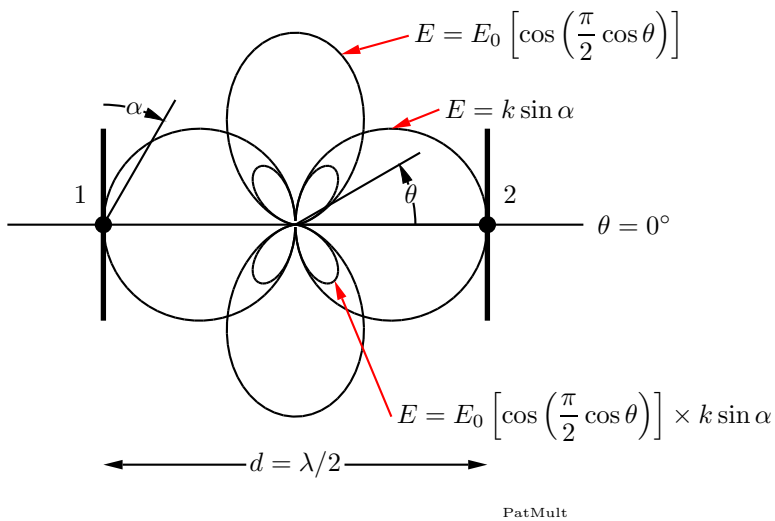
Figure 3: Pattern Multiplication.

$$E = E_0 \left[\cos\left(\frac{\pi}{2}\cos\theta\right)\right]$$

$$E = E_0 \left[\cos^5\left(\frac{\pi}{2}\cos\theta\right)\right]$$
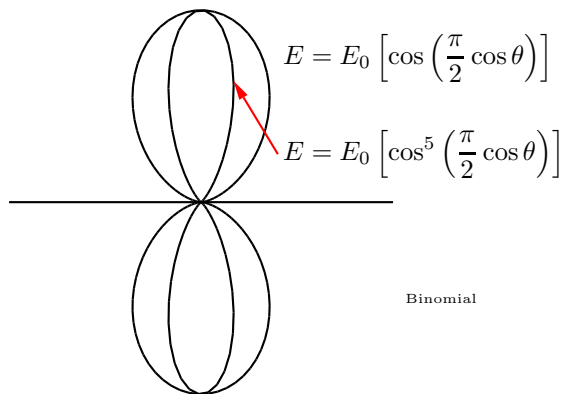
Binomial

Figure 4: Binomial array pattern

1 1

1 2 1

1 3 3 1

1 4 6 4 1

1 5 10 10 5 1

BinomialDots
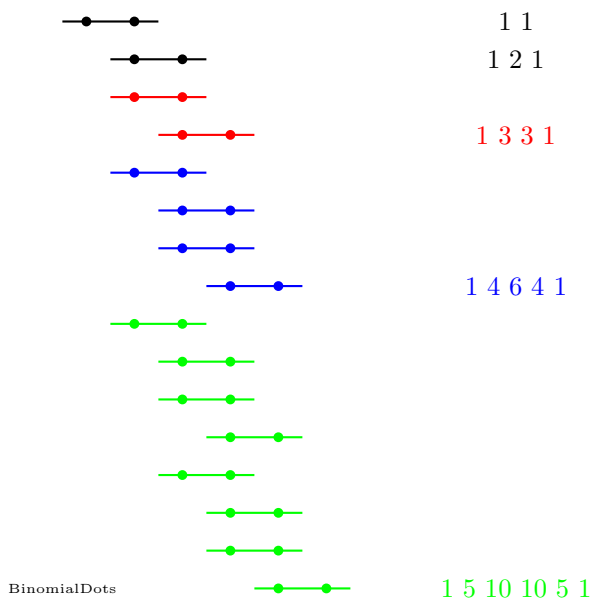
Figure 5: Binomial Pascal buildup

$\theta = 90°$

$\psi = \dfrac{2\pi d}{\lambda}\cos\theta$

ψ

θ

$\theta = 0°$

1   2   3   4   5

Uniform

|← d →|← d →|← d →|← d →|
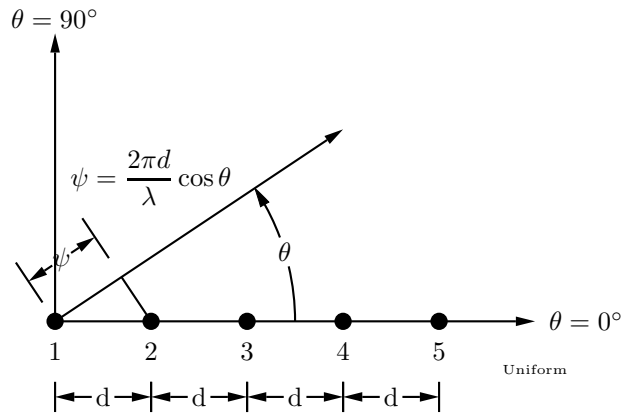
Figure 6: Uniform linear array of isotropic sources.

n=4

n=8

(d=λ/2)
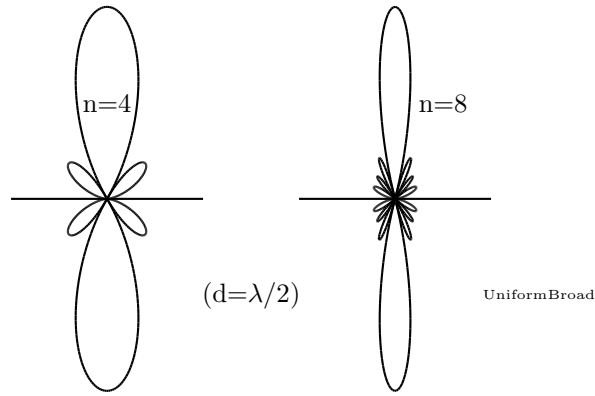
UniformBroad

Figure 7: Uniform Isotropic Broadside array

n=4   n=9   n=12

$d = \lambda/4; \beta d = \pi/2; \delta = -\pi/2$

UniformEnd1
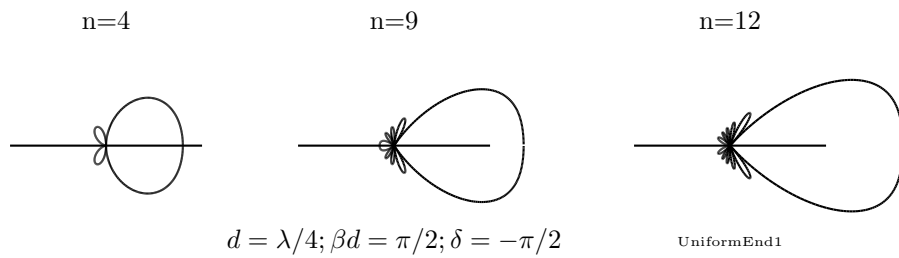
Figure 8: Uniform Isotropic Endfire Array, Rightwards

n=4   n=9   n=12

$d = \lambda/4; \beta d = \pi/2; \delta = +\pi/2$

UniformEnd2
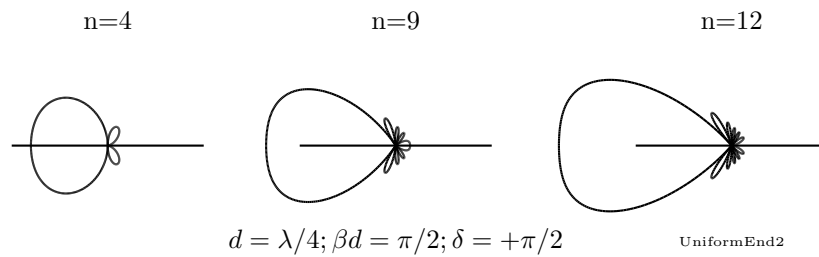
Figure 9: Uniform Isotropic Endfire Array, Leftwards

n=4   n=9   n=12

$$d = \lambda/2; \beta d = \pi; \delta = \pm\pi!!!$$

UniformEnd3
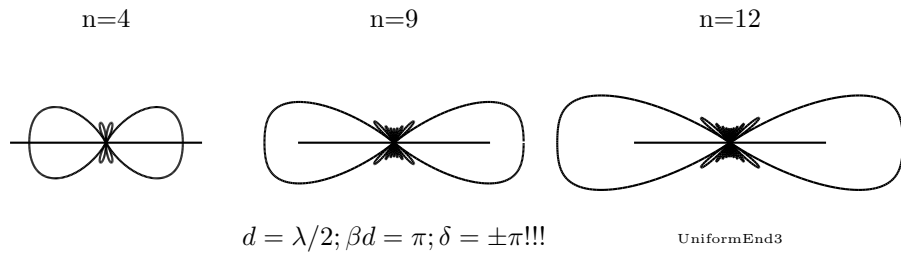
Figure 10: Uniform Isotropic Endfire Array, Ambiguity.

TenWave

Array Pat.10λ Hor. Dipole Pat.
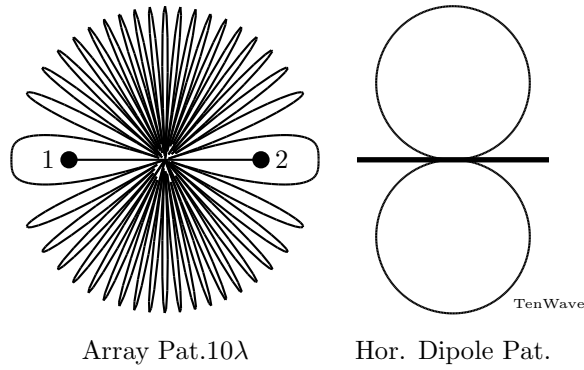
Figure 11: Array pattern of 2 isometric sources 10λ apart, and the element pattern.
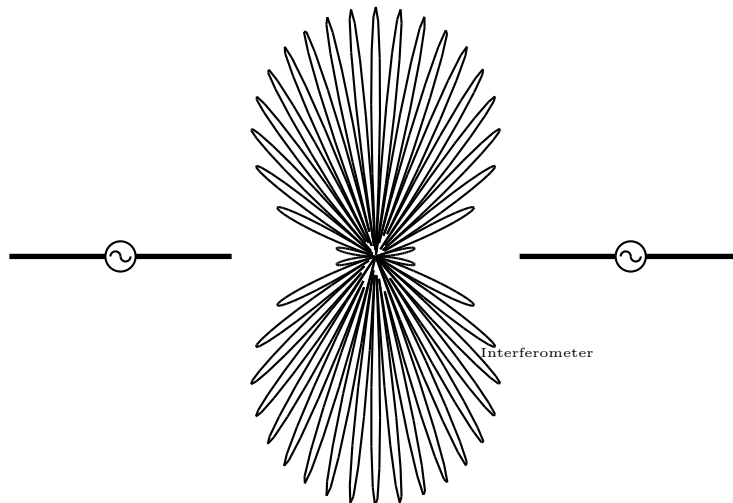

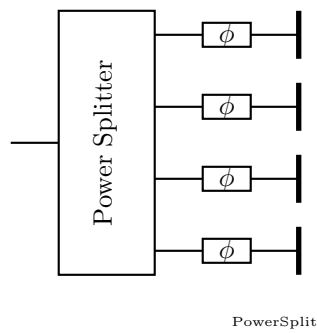Interferometer

Figure 12: Two in-phase dipoles 10λ apart.

PowerSplit

Figure 13: Power Splitter followed by phase modification.
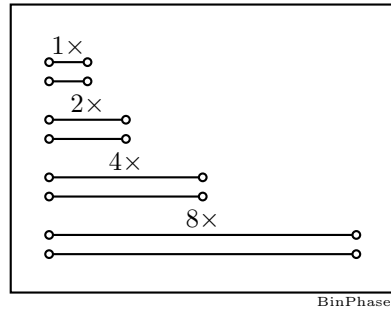
Figure 14: Binary phase shifter, based on transmission line segments.
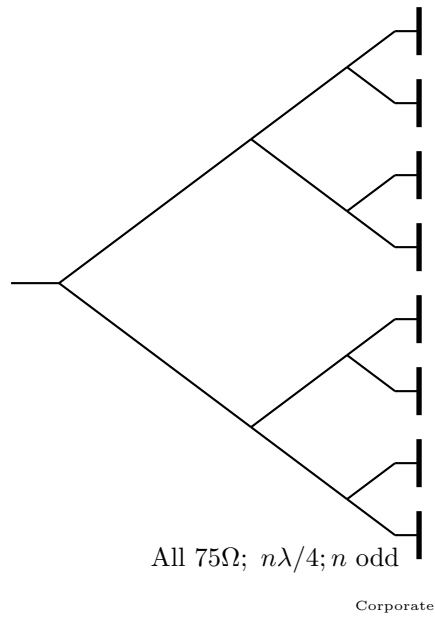

All 75Ω; $n\lambda/4; n$ odd

Figure 15: A Corporate feed network—equal amplitude and phase.