PHASE ARRAY RADIATION PATTERN

n=4;

l=1;

b=(k.\*d.\*cos(pi/4));

d=l/2;

d1=l/4;

d2=l;

d3=1.5\*l;

k=(2\*pi)/l;

t1=0:0.01:360;

si=((k\*d.\*cos(t1))-b);

si1=((k\*d1.\*(cos(t1)))-b);

si2=((k\*d2.\*(cos(t1)))-b);

si3=((k\*d3.\*(cos(t1)))-b);

af=(sin((n.\*si)./2))./(n.\*sin(si./2));

af3=(sin((n.\*si3)./2))./(n.\*sin(si3./2));

af1=(sin((n.\*si1)./2))./(n.\*sin(si1./2));

af2=(sin((n.\*si2)./2))./(n.\*sin(si2./2));

figure(1);

subplot(2,2,2)

polar(t1,af);

title('Phase array pattern for d=l/2 for n=4 for theta=45')

hold on;

subplot(2,2,1)

polar(t1,af1);

title('Phase array pattern for d=l/4 for n=4 for theta=45')

hold on;

subplot(2,2,3)

polar(t1,af2);

title('Phase array pattern for d=l for n=4 for theta=45')

hold on;

subplot(2,2,4)

polar(t1,af3);

title('Phase array pattern for d=3\*l/2 for n=4 for theta=45')

hold on;

n=4;

l=1;

b=(k.\*d.\*cos(3\*pi/4));

d=l/2;

d1=l/4;

d2=l;

d3=1.5\*l;

k=(2\*pi)/l;

t1=0:0.01:360;

si=((k\*d.\*cos(t1))-b);

si1=((k\*d1.\*(cos(t1)))-b);

si2=((k\*d2.\*(cos(t1)))-b);

si3=((k\*d3.\*(cos(t1)))-b);

af=(sin((n.\*si)./2))./(n.\*sin(si./2));

af3=(sin((n.\*si3)./2))./(n.\*sin(si3./2));

af1=(sin((n.\*si1)./2))./(n.\*sin(si1./2));

af2=(sin((n.\*si2)./2))./(n.\*sin(si2./2));

figure(2);

subplot(2,2,2)

polar(t1,af);

title('Phase array pattern for d=l/2 for n=4 for theta=135')

hold on;

subplot(2,2,1)

polar(t1,af1);

title('Phase array pattern for d=l/4 for n=4 for theta=135')

hold on;

subplot(2,2,3)

polar(t1,af2);

title('Phase array pattern for d=l for n=4 for theta=135')

hold on;

subplot(2,2,4)

polar(t1,af3);

title('Phase array pattern for d=3\*l/2 for n=4 fot theta=135')

hold on;

n=4;

l=1;

b=(k.\*d.\*cos(5\*pi/4));

d=l/2;

d1=l/4;

d2=l;

d3=1.5\*l;

k=(2\*pi)/l;

t1=0:0.01:360;

si=((k\*d.\*cos(t1))-b);

si1=((k\*d1.\*(cos(t1)))-b);

si2=((k\*d2.\*(cos(t1)))-b);

si3=((k\*d3.\*(cos(t1)))-b);

af=(sin((n.\*si)./2))./(n.\*sin(si./2));

af3=(sin((n.\*si3)./2))./(n.\*sin(si3./2));

af1=(sin((n.\*si1)./2))./(n.\*sin(si1./2));

af2=(sin((n.\*si2)./2))./(n.\*sin(si2./2));

figure(3);

subplot(2,2,2)

polar(t1,af);

title('Phase array pattern for d=l/2 for n=4 for theta=225')

hold on;

subplot(2,2,1)

polar(t1,af1);

title('Phase array pattern for d=l/4 for n=4 for theta=225')

hold on;

subplot(2,2,3)

polar(t1,af2);

title('Phase array pattern for d=l for n=4 for theta=225')

hold on;

subplot(2,2,4)

polar(t1,af3);

title('Phase array pattern for d=3\*l/2 for n=4 for theta=225')

hold on;

n=4;

l=1;

b=(k.\*d.\*cos(7\*pi/4));

d=l/2;

d1=l/4;

d2=l;

d3=1.5\*l;

k=(2\*pi)/l;

t1=0:0.01:360;

si=((k\*d.\*cos(t1))-b);

si1=((k\*d1.\*(cos(t1)))-b);

si2=((k\*d2.\*(cos(t1)))-b);

si3=((k\*d3.\*(cos(t1)))-b);

af=(sin((n.\*si)./2))./(n.\*sin(si./2));

af3=(sin((n.\*si3)./2))./(n.\*sin(si3./2));

af1=(sin((n.\*si1)./2))./(n.\*sin(si1./2));

af2=(sin((n.\*si2)./2))./(n.\*sin(si2./2));

figure(4);

subplot(2,2,2)

polar(t1,af);

title('Phase array pattern for d=l/2 for n=4 for theta=315')

hold on;

subplot(2,2,1)

polar(t1,af1);

title('Phase array pattern for d=l/4 for n=4 for theta=315')

hold on;

subplot(2,2,3)

polar(t1,af2);

title('Phase array pattern for d=l for n=4 for theta=315')

hold on;

subplot(2,2,4)

polar(t1,af3);

title('Phase array pattern for d=3\*l/2 for n=4 fot theta=315')

hold on;

BROADSIDE RADIATION PATTERN

n0=2;

l=1;

d=l/2;

d1=l/4;

d2=l;

d3=1.5\*l;

k=(2\*pi)/l;

t1=0:0.01:360;

si=(k\*d.\*cos(t1));

si1=k\*d1.\*(cos(t1));

si2=k\*d2.\*(cos(t1));

si3=k\*d3.\*(cos(t1));

af=(sin((n0.\*si)./2))./(n0.\*sin(si./2));

af3=(sin((n0.\*si3)./2))./(n0.\*sin(si3./2));

af1=(sin((n0.\*si1)./2))./(n0.\*sin(si1./2));

af2=(sin((n0.\*si2)./2))./(n0.\*sin(si2./2));

figure(4);

subplot(2,2,2)

polar(t1,af);

title('Broadside pattern for d=l/2 for n=2')

hold on;

subplot(2,2,1)

polar(t1,af1);

title('Broadside pattern for d=l/4 for n=2')

hold on;

subplot(2,2,3)

polar(t1,af2);

title('Broadside pattern for d=l for n=2')

hold on;

subplot(2,2,4)

polar(t1,af3);

title('Broadside pattern for d=3\*l/2 for n=2')

hold on;

n=4;

l=1;

d=l/2;

d1=l/4;

d2=l;

d3=1.5\*l;

k=(2\*pi)/l;

t1=0:0.01:360;

si=(k\*d.\*cos(t1));

si1=k\*d1.\*(cos(t1));

si2=k\*d2.\*(cos(t1));

si3=k\*d3.\*(cos(t1));

af=(sin((n.\*si)./2))./(n.\*sin(si./2));

af3=(sin((n.\*si3)./2))./(n.\*sin(si3./2));

af1=(sin((n.\*si1)./2))./(n.\*sin(si1./2));

af2=(sin((n.\*si2)./2))./(n.\*sin(si2./2));

figure(1);

subplot(2,2,2)

polar(t1,af);

title('Broadside pattern for d=l/2 for n=4')

hold on;

subplot(2,2,1)

polar(t1,af1);

title('Broadside pattern for d=l/4 for n=4')

hold on;

subplot(2,2,3)

polar(t1,af2);

title('Broadside pattern for d=l for n=4')

hold on;

subplot(2,2,4)

polar(t1,af3);

title('Broadside pattern for d=3\*l/2 for n=4')

hold on;

n1=8;

l=1;

d=l/2;

d1=l/4;

d2=l;

d3=1.5\*l;

k=(2\*pi)/l;

t1=0:0.01:360;

si=(k\*d.\*cos(t1));

si1=k\*d1.\*(cos(t1));

si2=k\*d2.\*(cos(t1));

si3=k\*d3.\*(cos(t1));

af=(sin((n1.\*si)./2))./(n1.\*sin(si./2));

af3=(sin((n1.\*si3)./2))./(n1.\*sin(si3./2));

af1=(sin((n1.\*si1)./2))./(n1.\*sin(si1./2));

af2=(sin((n1.\*si2)./2))./(n1.\*sin(si2./2));

figure(2);

subplot(2,2,2)

polar(t1,af);

title('Broadside pattern for d=l/2 for n=8')

hold on;

subplot(2,2,1)

polar(t1,af1);

title('Broadside pattern for d=l/4 for n=8')

hold on;

subplot(2,2,3)

polar(t1,af2);

title('Broadside pattern for d=l for n=8')

hold on;

subplot(2,2,4)

polar(t1,af3);

title('Broadside pattern for d=3\*l/2 for n=8')

hold on;

n2=12;

l=1;

d=l/2;

d1=l/4;

d2=l;

d3=1.5\*l;

k=(2\*pi)/l;

t1=0:0.01:360;

si=(k\*d.\*cos(t1));

si1=k\*d1.\*(cos(t1));

si2=k\*d2.\*(cos(t1));

si3=k\*d3.\*(cos(t1));

af=(sin((n2.\*si)./2))./(n2.\*sin(si./2));

af3=(sin((n2.\*si3)./2))./(n2.\*sin(si3./2));

af1=(sin((n2.\*si1)./2))./(n2.\*sin(si1./2));

af2=(sin((n2.\*si2)./2))./(n2.\*sin(si2./2));

figure(3);

subplot(2,2,2)

polar(t1,af);

title('Broadside pattern for d=l/2 for n=12')

hold on;

subplot(2,2,1)

polar(t1,af1);

title('Broadside pattern for d=l/4 for n=12')

hold on;

subplot(2,2,3)

polar(t1,af2);

title('Broadside pattern for d=l for n=12')

hold on;

subplot(2,2,4)

polar(t1,af3);

title('Broadside pattern for d=3\*l/2 for n=12')

hold on;

RADIATION PATTERN OF DIPOLE

y = pi./50;

x = 0:.1:360;

U = (cos(y\*cos(x))-cos(y))./sin(x);

U = abs(U);

figure(1);

polar(x,U);

title('Radiation Pattern for l=lamda/50');

figure(9);

plot(x,U)

y = pi./20;

x = 0:.1:360;

U = (cos(y\*cos(x))-cos(y))./sin(x);

U = abs(U);

figure(2);

polar(x,U);

title('Radiation Pattern for l=lamda/20');

y = pi./10;

x = 0:.1:360;

U = (cos(y\*cos(x))-cos(y))./sin(x);

U = abs(U);

figure(10);

polar(x,U);

title('Radiation Pattern for l=lamda/10');

y = pi./4;

x = 0:.1:360;

U = (cos(y\*cos(x))-cos(y))./sin(x);

U = abs(U);

figure(3);

polar(x,U);

title('Radiation Pattern for l=lamda/4');

y = pi./2;

x = 0:.1:360;

U = (cos(y\*cos(x))-cos(y))./sin(x);

U = abs(U);

figure(4);

polar(x,U);

title('Radiation Pattern for l=lamda/2');

y = pi;

x = 0:.1:360;

U = (cos(y\*cos(x))-cos(y))./sin(x);

U = abs(U);

figure(5);

polar(x,U);

title('Radiation Pattern for l=lamda');

y = 3\*pi./2;

x = 0:.1:360;

U = (cos(y\*cos(x))-cos(y))./sin(x);

U = abs(U);

figure(6);

polar(x,U);

title('Radiation Pattern for l=3\*lamda/2');

y = pi\*2;

x = 0:.1:360;

U = (cos(y\*cos(x))-cos(y))./sin(x);

U = abs(U);

figure(7);

polar(x,U);

title('Radiation Pattern for l=2\*lamda');

y = pi\*4;

x = 0:.1:360;

U = (cos(y\*cos(x))-cos(y))./sin(x);

U = abs(U);

figure(8);

polar(x,U);

title('Radiation Pattern for l=4\*lamda');

ENDFIRE RADIATION PATTERN

n=4;

l=1;

d=l/2;

d1=l/4;

d2=l;

d3=1.5\*l;

k=(2\*pi)/l;

t1=0:0.01:360;

sil=(k\*d.\*(cos(t1)-1));

si1l=k\*d1.\*(cos(t1)-1);

si2l=k\*d2.\*(cos(t1)-1);

si3l=k\*d3.\*(cos(t1)-1);

afl=(sin((n.\*sil)./2))./(n.\*sin(sil./2));

af3l=(sin((n.\*si3l)./2))./(n.\*sin(si3l./2));

af1l=(sin((n.\*si1l)./2))./(n.\*sin(si1l./2));

af2l=(sin((n.\*si2l)./2))./(n.\*sin(si2l./2));

si=(k\*d.\*(cos(t1)+1));

si1=k\*d1.\*(cos(t1)+1);

si2=k\*d2.\*(cos(t1)+1);

si3=k\*d3.\*(cos(t1)+1);

af=(sin((n.\*si)./2))./(n.\*sin(si./2));

af3=(sin((n.\*si3)./2))./(n.\*sin(si3./2));

af1=(sin((n.\*si1)./2))./(n.\*sin(si1./2));

af2=(sin((n.\*si2)./2))./(n.\*sin(si2./2));

figure(1);

subplot(2,2,3)

polar(t1,af);

title('Endfire pattern for d=l/2 for n=4')

hold on;

subplot(2,2,1)

polar(t1,af1);

title('Endfire pattern for d=l/4 for n=4')

hold on;

subplot(2,2,4)

polar(t1,afl);

title('Endfire pattern for d=l/2 for n=4')

hold on;

subplot(2,2,2)

polar(t1,af1l);

title('Endfire pattern for d=l/4 for n=4')

hold on;

figure(2);

subplot(2,2,1)

polar(t1,af2);

title('Endfire pattern for d=l for n=4')

hold on;

subplot(2,2,3)

polar(t1,af3);

title('Endfire pattern for d=3\*l/2 for n=4')

hold on;

subplot(2,2,2)

polar(t1,af2l);

title('Endfire pattern for d=l for n=4')

hold on;

subplot(2,2,4)

polar(t1,af3l);

title('Endfire pattern for d=3\*l/2 for n=4')

hold on;

n0=2;

l=1;

d=l/2;

d1=l/4;

d2=l;

d3=1.5\*l;

k=(2\*pi)/l;

t1=0:0.01:360;

sil=(k\*d.\*(cos(t1)-1));

si1l=k\*d1.\*(cos(t1)-1);

si2l=k\*d2.\*(cos(t1)-1);

si3l=k\*d3.\*(cos(t1)-1);

afl=(sin((n0.\*sil)./2))./(n0.\*sin(sil./2));

af3l=(sin((n0.\*si3l)./2))./(n0.\*sin(si3l./2));

af1l=(sin((n0.\*si1l)./2))./(n0.\*sin(si1l./2));

af2l=(sin((n0.\*si2l)./2))./(n0.\*sin(si2l./2));

si=(k\*d.\*(cos(t1)+1));

si1=k\*d1.\*(cos(t1)+1);

si2=k\*d2.\*(cos(t1)+1);

si3=k\*d3.\*(cos(t1)+1);

af=(sin((n0.\*si)./2))./(n0.\*sin(si./2));

af3=(sin((n0.\*si3)./2))./(n0.\*sin(si3./2));

af1=(sin((n0.\*si1)./2))./(n0.\*sin(si1./2));

af2=(sin((n0.\*si2)./2))./(n0.\*sin(si2./2));

figure(3);

subplot(2,2,3)

polar(t1,af);

title('Endfire pattern for d=l/2 for n=2')

hold on;

subplot(2,2,1)

polar(t1,af1);

title('Endfire pattern for d=l/4 for n=2')

hold on;

subplot(2,2,4)

polar(t1,afl);

title('Endfire pattern for d=l/2 for n=2')

hold on;

subplot(2,2,2)

polar(t1,af1l);

title('Endfire pattern for d=l/4 for n=2')

hold on;

figure(4);

subplot(2,2,1)

polar(t1,af2);

title('Endfire pattern for d=l for n=2')

hold on;

subplot(2,2,3)

polar(t1,af3);

title('Endfire pattern for d=3\*l/2 for n=2')

hold on;

subplot(2,2,2)

polar(t1,af2l);

title('Endfire pattern for d=l for n=2')

hold on;

subplot(2,2,4)

polar(t1,af3l);

title('Endfire pattern for d=3\*l/2 for n=2')

hold on;

n1=8;

l=1;

d=l/2;

d1=l/4;

d2=l;

d3=1.5\*l;

k=(2\*pi)/l;

t1=0:0.01:360;

sil=(k\*d.\*(cos(t1)-1));

si1l=k\*d1.\*(cos(t1)-1);

si2l=k\*d2.\*(cos(t1)-1);

si3l=k\*d3.\*(cos(t1)-1);

afl=(sin((n1.\*sil)./2))./(n1.\*sin(sil./2));

af3l=(sin((n1.\*si3l)./2))./(n1.\*sin(si3l./2));

af1l=(sin((n1.\*si1l)./2))./(n1.\*sin(si1l./2));

af2l=(sin((n1.\*si2l)./2))./(n1.\*sin(si2l./2));

si=(k\*d.\*(cos(t1)+1));

si1=k\*d1.\*(cos(t1)+1);

si2=k\*d2.\*(cos(t1)+1);

si3=k\*d3.\*(cos(t1)+1);

af=(sin((n1.\*si)./2))./(n1.\*sin(si./2));

af3=(sin((n1.\*si3)./2))./(n1.\*sin(si3./2));

af1=(sin((n1.\*si1)./2))./(n1.\*sin(si1./2));

af2=(sin((n1.\*si2)./2))./(n1.\*sin(si2./2));

figure(5);

subplot(2,2,3)

polar(t1,af);

title('Endfire pattern for d=l/2 for n=8')

hold on;

subplot(2,2,1)

polar(t1,af1);

title('Endfire pattern for d=l/4 for n=8')

hold on;

subplot(2,2,4)

polar(t1,afl);

title('Endfire pattern for d=l/2 for n=8')

hold on;

subplot(2,2,2)

polar(t1,af1l);

title('Endfire pattern for d=l/4 for n=8')

hold on;

figure(6);

subplot(2,2,1)

polar(t1,af2);

title('Endfire pattern for d=l for n=8')

hold on;

subplot(2,2,3)

polar(t1,af3);

title('Endfire pattern for d=3\*l/2 for n=8')

hold on;

subplot(2,2,2)

polar(t1,af2l);

title('Endfire pattern for d=l for n=8')

hold on;

subplot(2,2,4)

polar(t1,af3l);

title('Endfire pattern for d=3\*l/2 for n=8')

hold on;

n2=12;

l=1;

d=l/2;

d1=l/4;

d2=l;

d3=1.5\*l;

k=(2\*pi)/l;

t1=0:0.01:360;

sil=(k\*d.\*(cos(t1)-1));

si1l=k\*d1.\*(cos(t1)-1);

si2l=k\*d2.\*(cos(t1)-1);

si3l=k\*d3.\*(cos(t1)-1);

afl=(sin((n2.\*sil)./2))./(n2.\*sin(sil./2));

af3l=(sin((n2.\*si3l)./2))./(n2.\*sin(si3l./2));

af1l=(sin((n2.\*si1l)./2))./(n2.\*sin(si1l./2));

af2l=(sin((n2.\*si2l)./2))./(n2.\*sin(si2l./2));

si=(k\*d.\*(cos(t1)+1));

si1=k\*d1.\*(cos(t1)+1);

si2=k\*d2.\*(cos(t1)+1);

si3=k\*d3.\*(cos(t1)+1);

af=(sin((n2.\*si)./2))./(n2.\*sin(si./2));

af3=(sin((n2.\*si3)./2))./(n2.\*sin(si3./2));

af1=(sin((n2.\*si1)./2))./(n2.\*sin(si1./2));

af2=(sin((n2.\*si2)./2))./(n2.\*sin(si2./2));

figure(7);

subplot(2,2,3)

polar(t1,af);

title('Endfire pattern for d=l/2 for n=12')

hold on;

subplot(2,2,1)

polar(t1,af1);

title('Endfire pattern for d=l/4 for n=12')

hold on;

subplot(2,2,4)

polar(t1,afl);

title('Endfire pattern for d=l/2 for n=12')

hold on;

subplot(2,2,2)

polar(t1,af1l);

title('Endfire pattern for d=l/4 for n=12')

hold on;

figure(8);

subplot(2,2,1)

polar(t1,af2);

title('Endfire pattern for d=l for n=12')

hold on;

subplot(2,2,3)

polar(t1,af3);

title('Endfire pattern for d=3\*l/2 for n=12')

hold on;

subplot(2,2,2)

polar(t1,af2l);

title('Endfire pattern for d=l for n=12')

hold on;

subplot(2,2,4)

polar(t1,af3l);

title('Endfire pattern for d=3\*l/2 for n=12')

hold on;