```matlab
function s=bopu(fengji,duanshu)

u=[3,5,7,9,11,13,15,17];

wavewmax = [16.444115 9.866469 7.047480 5.481373 4.484760

3.794799 3.288826 2.90190];

if fengji>8

    fengji=8;

end

if fengji<1

    fengji=1;

end

fi=fengji;

u=u(fi);

wmin=0;

wmax=wavewmax(fi);

m=duanshu;

wavemn=(wmax-wmin)/m;

w=[wmin:wavemn:wmax];

s=0.81*exp(-7400./(w*u+eps).^4)./(w.^5+eps);

plot(w,s);
```

```matlab
function [z]=erweihailangboxing(fengji,pinpushu,jiaodushu)



% 3 2.438306 16.444115   4.053570

% 5 1.462983 9.866469    2.432142

% 7 1.044989 7.047480    1.737244

% 9 0.812770 5.481373    1.351190

% 11 0.664988 4.484760   1.105519

% 13 0.562683 3.794799   0.935439

% 15 0.487659 3.288826   0.810714

% 17 0.430288 2.901905   0.715336



wavewmin = [2.438306 1.462983 1.044989 0.812770 0.664988 0.562683
0.487659 0.430288];

wavewmax = [16.444115 9.866469 7.047480 5.481373 4.484760
3.794799 3.288826 2.90190];

wavewp=[4.053570 2.432142 1.737244 1.351190 1.105519 0.935439
0.810714 0.715336];



%-------------------------------------------------
```

```
u=[3,5,7,9,11,13,15,17];

%------------------------------------------------



if fengji>8

    fengji=8;

end

if fengji<1

    fengji=1;

end

fi=fengji;

wmin=wavewmin(fi);

wmax=wavewmax(fi);

wp=wavewp(fi);

ui=u(fi);

M=pinpushu;

N=jiaodushu;

wavewn=(wmax-wmin)/M;

thetawn=pi/N;

dx=1;

dy=1;

x=[0:dx:500];
```

```matlab
y=[0:dy:300];

[x,y]=meshgrid(x,y);

z=zeros(size(x));

for wi=1:M

    for ki=1:N

        theta=-pi/2+(ki-1)*thetawn;

        epsin=rand*2*pi;

        w=wmin+(wi-1)*wavewn+wavewn/2;

        swi=0.81*exp(-7400/(w*ui+eps).^4)*2*(cos(theta)).^2/(pi*(w.^5+
eps));

        an=sqrt(2*swi*wavewn*theta);

        z1=w*w*x*cos(theta)/9.8+w*w*y*sin(theta)/9.8+epsin;

        z=an*cos(z1)+z;

    end

end

surfl(x,y,z);

shading interp;

lightangle(-45,30);

set(findobj(gca,'type','surface'),'FaceLighting','phong','AmbientStrength',

.3,'DiffuseStrength',.8,...

    'SpecularStrength',.9,'SpecularExponent',200)
```

```matlab
function [y1]=hailangboxing(fengji,duanshu)



% 3 2.438306 16.444115   4.053570

% 5 1.462983 9.866469    2.432142

% 7 1.044989 7.047480    1.737244

% 9 0.812770 5.481373    1.351190

% 11 0.664988 4.484760   1.105519

% 13 0.562683 3.794799   0.935439

% 15 0.487659 3.288826   0.810714

% 17 0.430288 2.901905   0.715336



wavewmin = [2.438306 1.462983 1.044989 0.812770 0.664988 0.562683 0.487659 0.430288];

wavewmax = [16.444115 9.866469 7.04748 5.481373 4.484760 3.794799 3.288826 2.901905];

wavewp=[4.053570  2.432142  1.737244  1.351190  1.105519  0.935439 0.810714 0.715336];
```

```matlab
%---------------------------------------------------

u=[3 5 7 9 11 13 15 17];

%--------------------------------------------------



if fengji>8

    fengji=8;

end

if fengji<1

    fengji=1;

end

fi=fengji;

wmin=wavewmin(fi);

wmax=wavewmax(fi);

%wp=wavewp(fi);

ui=u(fi);

M=duanshu;

%epsin=rand*2*pi;

wavewn=(wmax-wmin)/M;

dx=0.5;

dz=0.5;
```

```matlab
x=[0:dx:125];

z=[0:dz:125];

[x,z]=meshgrid(x,z);

y=zeros(size(x));

for wi=1:M

    epsin=rand*2*pi;

    w=wmin+(wi-1)*wavewn;

    swi=0.81*exp(-7400/(w*ui+eps).^4)/(w.^5+eps);

    an=sqrt(2*swi*wavewn);

    y1=w*w*x/9.8+epsin;

    y=an*cos(y1)+y;

end

y1=y(25,:);

plot(y1);

function [data1]=SDwave(N,initWave)
%输入 N 为：方阵的维数 2^N+1,在方阵的四个角的顶点上放置的初值，
maxWave 为波动的程度
%这里定为四个初值一样，这是可拼接的必要条件
% Example:
%       tic;
%       d=SquareDiamond2(5,0,10);
```

```matlab
%        d=d-mod(d,1);

%        colormap(pink);

%

%        surf(d);

%        shading faceted

%        axis equal

%        toc



%n=2^N;

% data=zeros(n+1);

% data(1,1)=initvalue;

% data(1,n+1)=initvalue;

% data(n+1,1)=initvalue;

% data(n+1,n+1)=initvalue;

data=initWave;

r0=0.03;

for i1=1:N

    w=(N-i1)/(N-1);

    r=r0*w*w;

    data=mytry(data,r);
```

```matlab
    nd=size(data,1);

for idn=2:nd-1

    for idm=2:nd-1

        data1(idn,idm)=(1/6)*(data(idn,idm-1)+data(idn,idm+1)+data(idn+1,idm)+data(idn-1,idm)+data(idn,idm)+data(idn,idm));

    end

end



end

colormap(winter);

surf(data1);




function [x]=rnd(absvalue)
```

%扩展的随机函数生成器，产生绝对值小于 absvalue 的随机实数

x=(rand(1)-0.5)*2*absvalue;

function [data]=mytry(initdata,r)

%square=====================================

%x---x

%-----

%--0--　由四个 x 定中间的 0

%-----

%x---x

m=2;

n0=size(initdata,1);

for i1=1:n0

    for i2=1:n0

    data(i1*2-1,i2*2-1)=initdata(i1,i2);

    end

end

  n=n0*2-2;

for i=1:m:n

  for j=1:m:n

```matlab
        data((i+i+m)/2,(j+j+m)/2)=(data(i,j)+data(i,j+m)+data(i+m,j)+data(i+m,j+m))/4+rnd(r);

    end

end

%diamond=================================

%---x--

%-----

%x-0-x  由四个 x 定中间的 0

%-----

%---x--




%钻石步骤的横向部分

%line No.1 and last

for j=1+m/2:m:n

    data(1,j)=(data(1,j+m/2)+data(1+m/2,j)+data(1,j-m/2)+data(n+1-m/2,j))/4+rnd(r);

    data(n+1,j)=data(1,j);

end

%middle

for i=1+m:m:n
```

```matlab
   for j=1+m/2:m:n

       data(i,j)=(data(i,j+m/2)+data(i+m/2,j)+data(i,j-m/2)+data(i-m/2,j))/4
+rnd(r);

      end

end
```

%钻石步骤的纵向部分

%line No.1 and last

```matlab
for i=1+m/2:m:n

    data(i,1)=(data(i,1+m/2)+data(i+m/2,1)+data(i,n+1-m/2)+data(i-m/2,
1))/4+rnd(r);

    data(i,n+1)=data(i,1);

end
```

%middle

```matlab
for i=1+m/2:m:n

   for j=1+m:m:n

       data(i,j)=(data(i,j+m/2)+data(i+m/2,j)+data(i,j-m/2)+data(i-m/2,j))/4
+rnd(r);

      end

end
```

```
% if (m>2)

%    data=mytry(data,m/2,r/3,n);

% end

%
```