APPENDIX

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APPENDIX A:

MATLAB code for z-direction pulse design is shown below.

```
%% Define zgrad %%
pwgza=gmax/dgdtmax*0.6;                    %gamx=40mt/m dgdtmax=slew
rate;
ramppnts=ceil(pwgza/pointtime);            %pointime is dwell time=4usec
agz=2*pi/(gam*fovz*pwgza);                 %gauss/cm
gzramp=(0:ramppnts)/ramppnts*agz';
gz_temp=[gzramp gzramp((ramppnts-1):-1:1)];
ngzpnts=length(gz_temp);
gzslr=agz/ramppnts/pointtime

%% Define zgrad rewinder %%
agzre=agz*nzpnts/2
gzramp=(0:ramppnts)/ramppnts;
temp=[gzramp gzramp((ramppnts-1):-1:1)];
sumrepnts=sum(temp);

if(agzre>gmax)
  new_ramppnts=ceil(ramppnts*agzre/gmax);
  gzramp=(0:new_ramppnts)/new_ramppnts;
  temp=[gzramp gzramp((new_ramppnts-1):-1:1)];
  sumrepnts_test=sum(temp);
  ampscale=sumrepnts/sumrepnts_test
else
  new_ramppnts=ramppnts;
  ampscale=1;
end

agzre1=ampscale*agz*((nzpnts/2));          %gauss/cm
agzre2=ampscale*agz*((nzpnts/2)-1);        %gauss/cm
agzre3=ampscale*agz*(1);
agzre4=ampscale*agz*(2);
gzramp=(0:new_ramppnts)/new_ramppnts;
temp=[gzramp gzramp((new_ramppnts-1):-1:1)];
ngzrepnts=length(temp);
gzre1_temp=temp*agzre1';
gzre2_temp=temp*agzre2';
gzre3_temp=temp*agzre3';
gzre4_temp=temp*agzre4';
npnts=(nzpnts/2+1)*ngxypnts+ngzrepnts      %% Reduce
sampling
                                  points along z-direction was here
%%
pulsewidth=pointtime*npnts
```

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```
....
%% Build the z grad %%
nshots=2;
for shotn=1:nshots

 %% define rotation angles of stack spiral%%
  phi=2*pi*(shotn-1)/nshots;
  cphi=cos(phi);
  sphi=sin(phi);

…… %% build the size of vectors was skip
e.g.vec2=(1:ngzpnts)+ngzrepnts-ngzpnts+ngxypnts+(znum-2)*ngxypnts;
%%.....

    if(nogz==0)
      if(znum==2)
        gz(shotn,1:ngzrepnts)=-gzre2_temp.*(cos(pi*((shotn-1))));
        gz(shotn,vec2)=gz_temp.*(cos(pi*((shotn-1))));
        elseif(znum==(nzpnts/2)|znum==(nzpnts/2)+1)
         gz(shotn,((1:ngzrepnts)+((nzpnts/2-1)*ngxypnts+ngzrepnts)-
ngzrepnts))=gz_temp.*(cos(pi*((shotn-1))));
         rf(shotn,vec6)=(scal)*rf1;
         gz(shotn,((1:ngzrepnts)+((nzpnts/2-2)*ngxypnts+ngzrepnts)-
ngzrepnts))=gz_temp.*(cos(pi*((shotn-1))));
         rf(shotn,vec6)=(scal)*rf1;

      elseif(znum==(nzpnts/2)+2)
        gz(shotn,((1:ngzrepnts)+((nzpnts/2)*ngxypnts+ngzrepnts)-
ngzrepnts))=gz_temp.*(cos(pi*((shotn-1))));
        rf(shotn,vec6)=(scal)*rf1;
        gz(shotn,((1:ngzrepnts)+((nzpnts/2+1)*ngxypnts+ngzrepnts)-
ngzrepnts))=-gzre3_temp.*(cos(pi*((shotn-1))));

      else
        gz(shotn,vec2)=gz_temp.*(cos(pi*((shotn-1))));
      end
      end
end
```

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APPENDIX B

The MATLAB code for weighting function is shown below:

```
%% Make xy weighting %%
    kxloc=floor((kxnew/kmax/roversamps+1)*sz/2)+1;
    kyloc=floor((kynew/kmax/roversamps+1)*sz/2)+1;
    for kstep=1:length(vec5)
      kxind=kxloc(kstep);
      kyind=kyloc(kstep);
      xyweight(kstep)=(xyzftim1(znum,kxind,kyind));
  end
```

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