MATLAB Assignment #3

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Class: Digital Image Processing(ECEN-657)

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**MATLAB program:**

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| %% Matlab Assignment #3  % author : Mrinmoy Sarkar  % email : msarkar@aggies.ncat.edu  % date : 3/26/2018  %%  clear all; close all;    %% form f(x,y)  X=1:251;  Y=1:251;  [xx,yy]=meshgrid(Y,X);  f = zeros(251,251,'logical');  f(120:130,:)=1;    %% form g(x,y)  g = zeros(251,251,'logical');  g(120:130,120:130)=1;    %% plot and image show f(x,y) and g(x,y)  figure(1)  subplot(221)  mesh(xx,yy,f);  title('f(x,y)')  subplot(222)  imshow(f)  title('f(x,y)')  subplot(223)  mesh(xx,yy,g)  title('g(x,y)')  subplot(224)  imshow(g)  title('g(x,y)')    %% find F(u,v) and G(u,v)  F = fft2(f);  G = fft2(g);    %% plot and image show |F(u,v)| and |G(u,v)|  figure(2)  subplot(221)  mesh(xx,yy,abs(F));  title('|F(u,v)|')  subplot(222)  imshow(abs(F))  title('|F(u,v)|')  subplot(223)  mesh(xx,yy,abs(G))  title('|G(u,v)|')  subplot(224)  imshow(abs(G))  title('|G(u,v)|')    %% plot and image show phase(F(u,v)) and phase(G(u,v))  figure(3)  subplot(221)  mesh(xx,yy,angle(F));  title('phase(F(u,v))')  subplot(222)  imshow(angle(F))  title('phase(F(u,v))')  subplot(223)  mesh(xx,yy,angle(G))  title('phase(G(u,v))')  subplot(224)  imshow(angle(G))  title('phase(G(u,v))')    %% plot and image show circular shift of |F(u,v)| and |G(u,v)|  figure(4)  subplot(221)  mesh(xx,yy,abs(fftshift(F)));  title('circular shifted |F(u,v)|')  subplot(222)  imshow(abs(fftshift(F)))  title('circular shifted |F(u,v)|')  subplot(223)  mesh(xx,yy,abs(fftshift(G)))  title('circular shifted |G(u,v)|')  subplot(224)  imshow(abs(fftshift(G)))  title('circular shifted |G(u,v)|')    %% plot and image show circular shift of phase(F(u,v)) and phase(G(u,v))  figure(5)  subplot(221)  mesh(xx,yy,angle(fftshift(F)));  title('circular shifted phase(F(u,v))')  subplot(222)  imshow(angle(fftshift(F)))  title('circular shifted phase(F(u,v))')  subplot(223)  mesh(xx,yy,angle(fftshift(G)))  title('circular shifted phase(G(u,v))')  subplot(224)  imshow(angle(fftshift(G)))  title('circular shifted phase(G(u,v))') |

**Figures:**

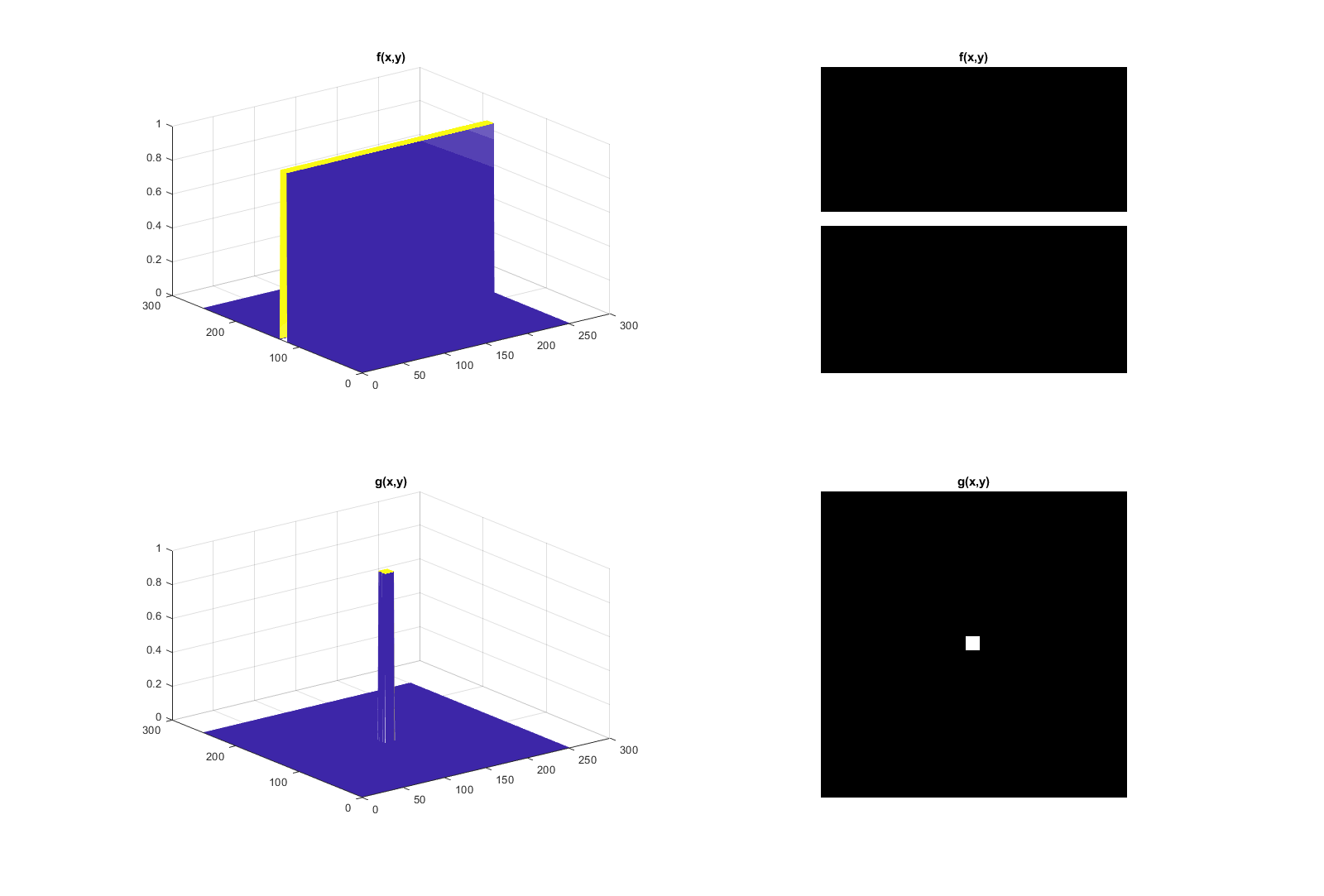


Figure 1: f(x,y) and g(x,y)

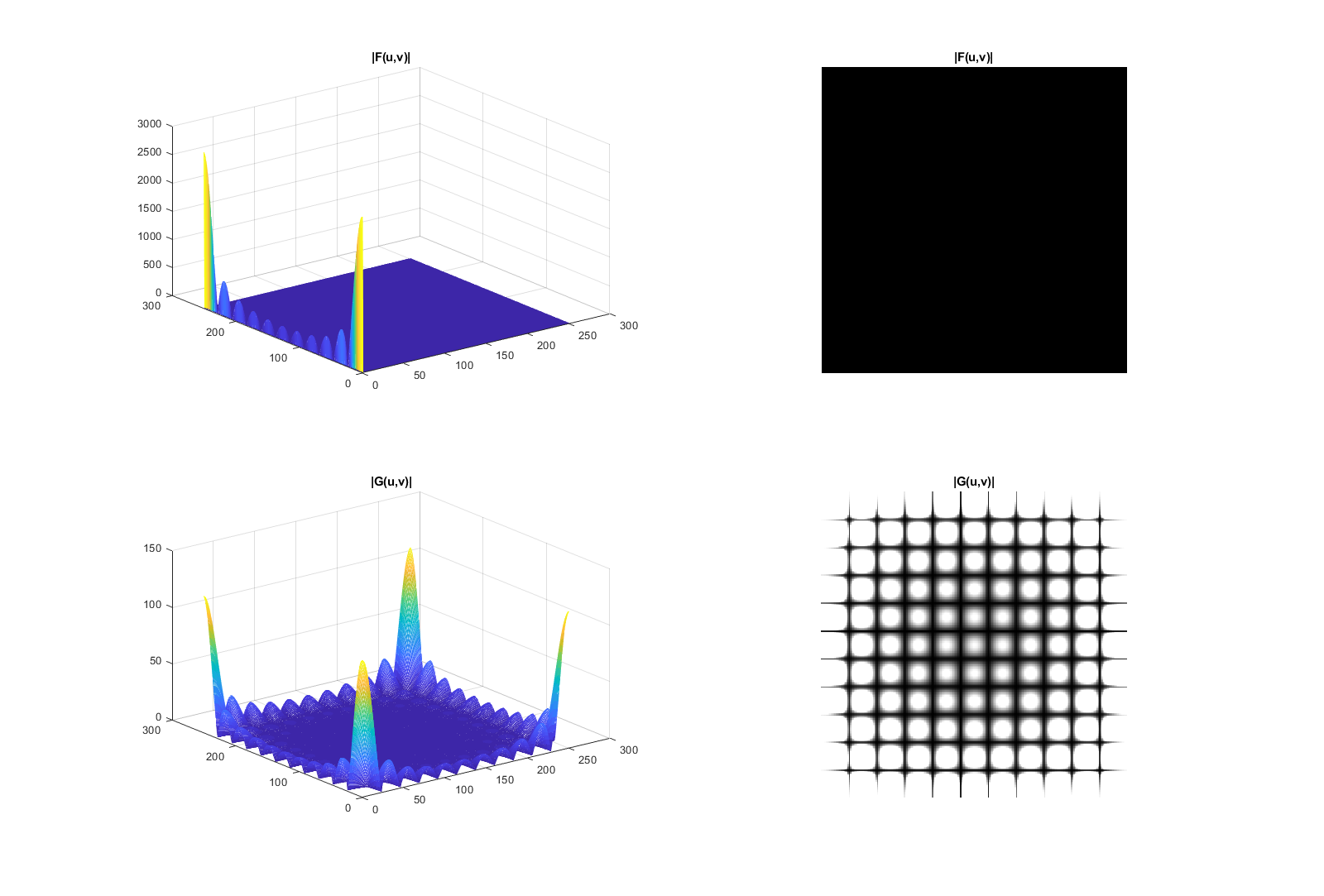


Figure 2: |F(u,v)| and |G(u,v)|

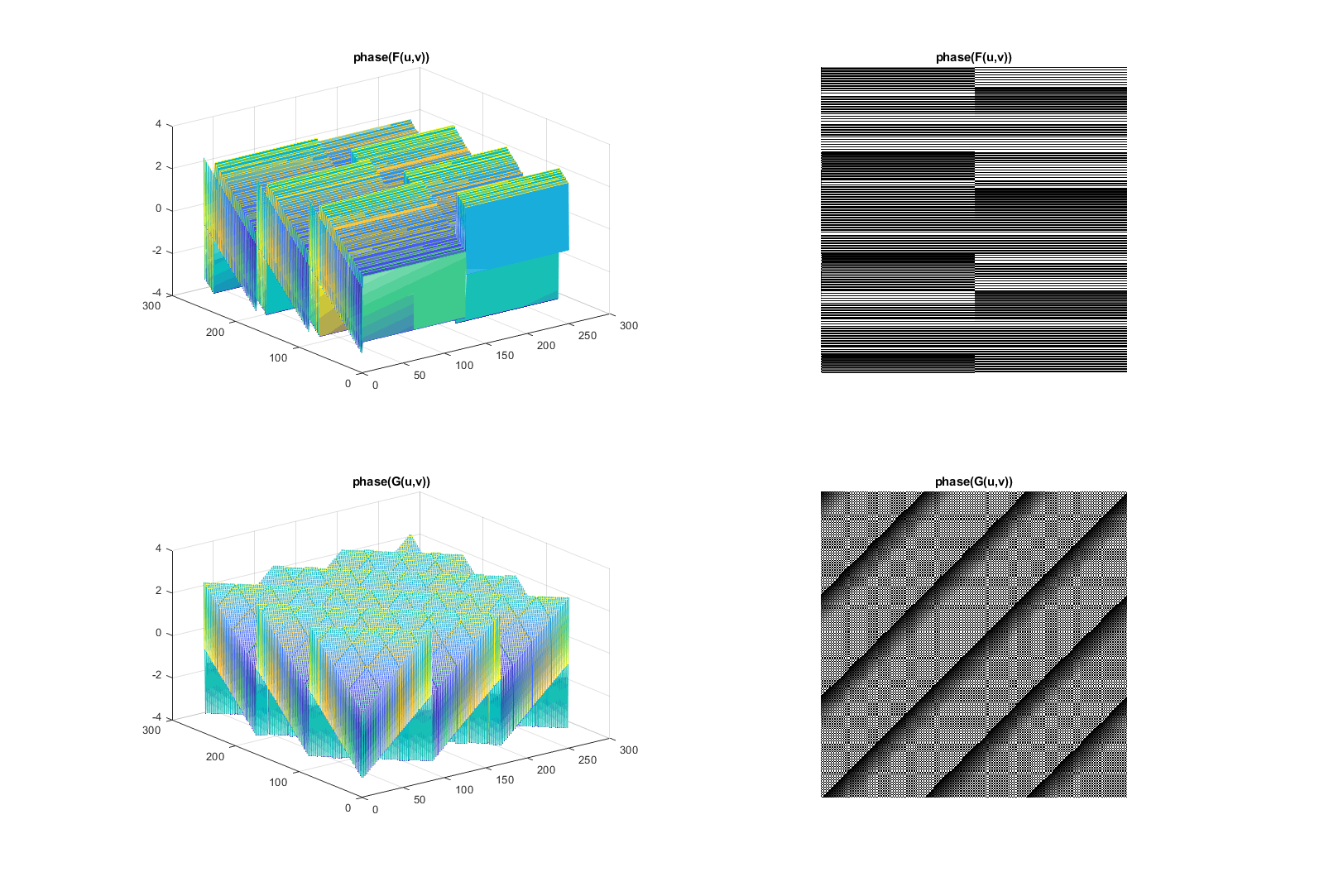


Figure 3: phase(F(u,v)) and phase(G(u,v))

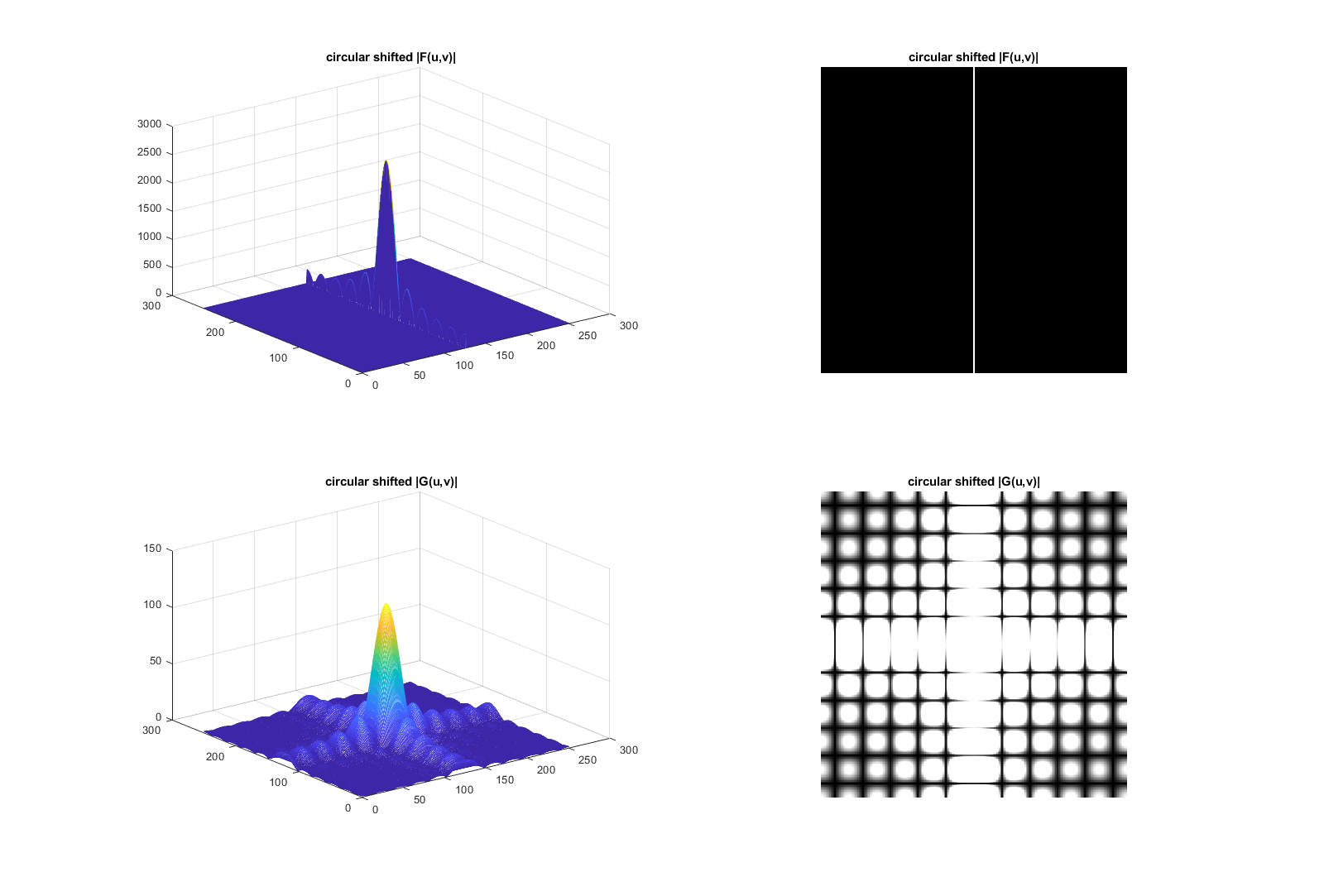


Figure 4: circular shifted |F(u,v)| and |G(u,v)|

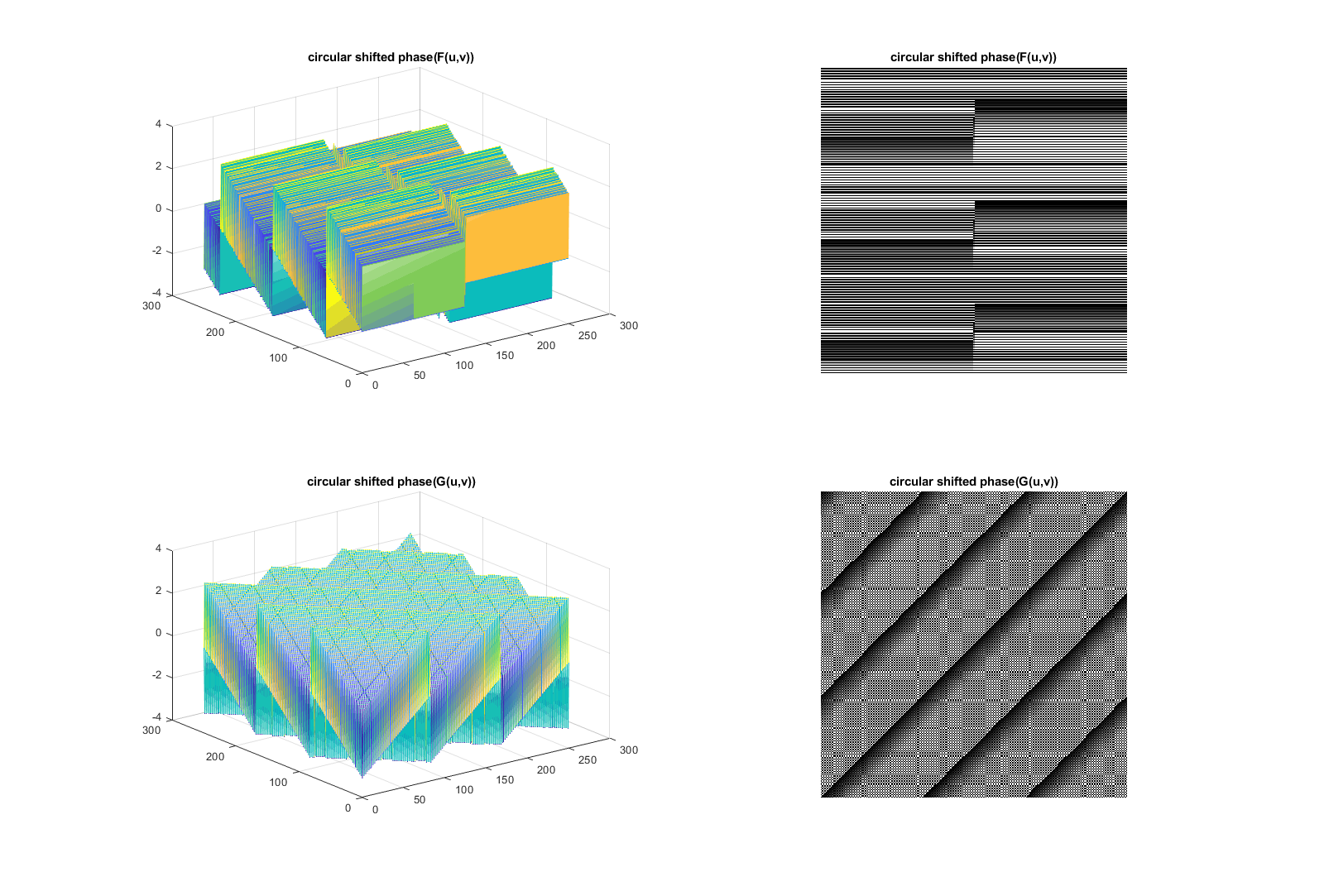


Figure 5: circular shifted phase(F(u,v)) and phase(G(u,v))

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