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Sample Tabulated Scattering vs HG

In this example, we will show how to build tabulated scatter in 2D and 3D and compare the sampling from the tabulated scattering scattering in multiple scattering case

```
% first build the target area for 2D and 3D
boxTargetArea2D = boxArea( ...
    1 ,          ... wavelength
    200,         ... MFP
    [-300,300], ... z
    [-300,300]  ... x
);

boxTargetArea3D = boxArea( ...
    1 ,          ... wavelength
    200,         ... MFP
    [-300,300], ... z
    [-300,300], ... x
    [-300,300]  ... y
);

% and the lighting and views
viewDirections = 0:1:360; % in deg
views = farFieldSource(deg2rad(viewDirections),0);
lights = farFieldSource(0,0); % light in 0 deg direction

% the g parameter we comapre with
gParam = 0.7;
```

Build 2D tabulated HG function

```
% the 2D direction vector MUST being with 0 and end with 2*pi
directions2D = (0:1e-4:1) * 2 * pi;
hg2Damplitude = sqrt(evaluateHG(directions2D, gParam, 0, 2));

% solve for both tabulated and HG
tic
hgRes = scmc(boxTargetArea2D, views, lights, HGScatter(gParam),
 1e4, ...
    'parforIters', 12);
toc

tic
tabRes = scmc(boxTargetArea2D, views, lights, ...
```

```
            tabulatedAmplitudeScatter(directions2D,hg2Damplitude), 1e4, ...
        'parforIters', 12);
    toc

    % plot the intensity of both results
    figure
    polarplot(deg2rad(viewDirections),diag(abs(hgRes.C)));
    hold on
    polarplot(deg2rad(viewDirections),diag(abs(tabRes.C)));

    legend('HG','Tabulated HG');
    title('2D HG plot')

    Elapsed time is 664.179971 seconds.
    Elapsed time is 663.650285 seconds.
```
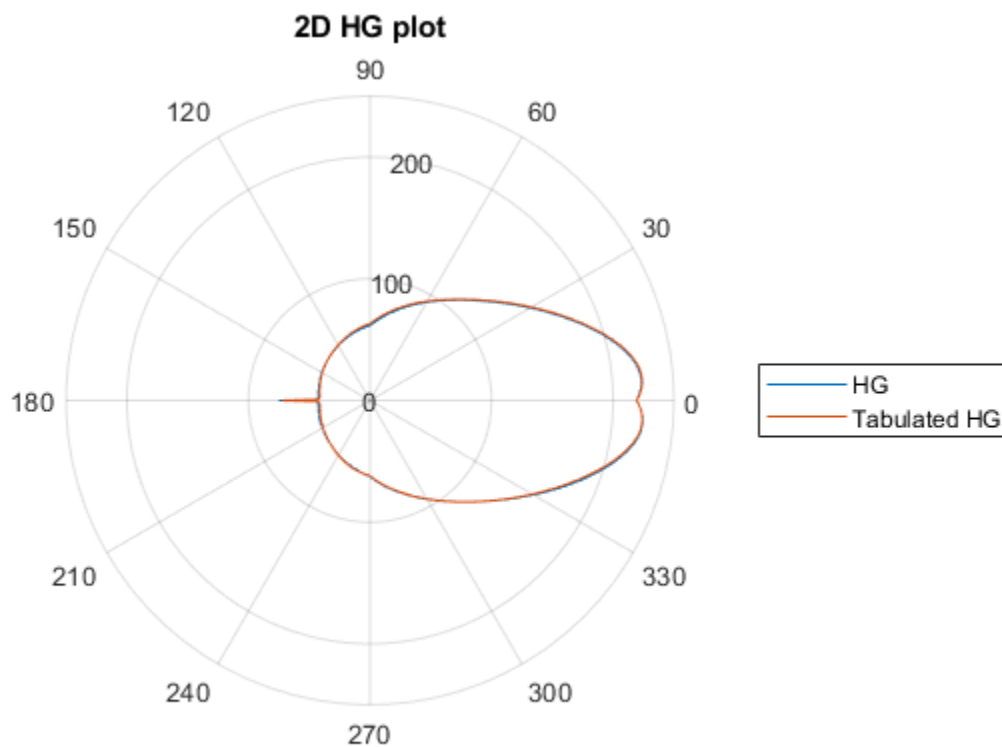

2D HG plot

Build 3D tabulated HG function

```
    % the 3D direction vector MUST being with 0 and end with pi, theta is
     the
    % elevation direction
    cosThetaVals3D = (0:1e-4:1) * pi;
    hg3Damplitude = sqrt(evaluateHG(cosThetaVals3D, gParam, 0, 3));

    % solve for both tabulated and HG
    tic
```

```matlab
hgRes = scmc(boxTargetArea3D, views, lights, HGScatter(gParam),
 1e4, ...
    'parforIters', 12);
toc

tic
tabRes = scmc(boxTargetArea3D, views, lights, ...
    tabulatedAmplitudeScatter(cosThetaVals3D,hg3Damplitude), 1e4, ...
    'parforIters', 12);
toc

% plot the intensity of both results
figure
polarplot(deg2rad(viewDirections),diag(abs(hgRes.C)));
hold on
polarplot(deg2rad(viewDirections),diag(abs(tabRes.C)));

legend('HG','Tabulated HG');
title('3D HG plot')
```
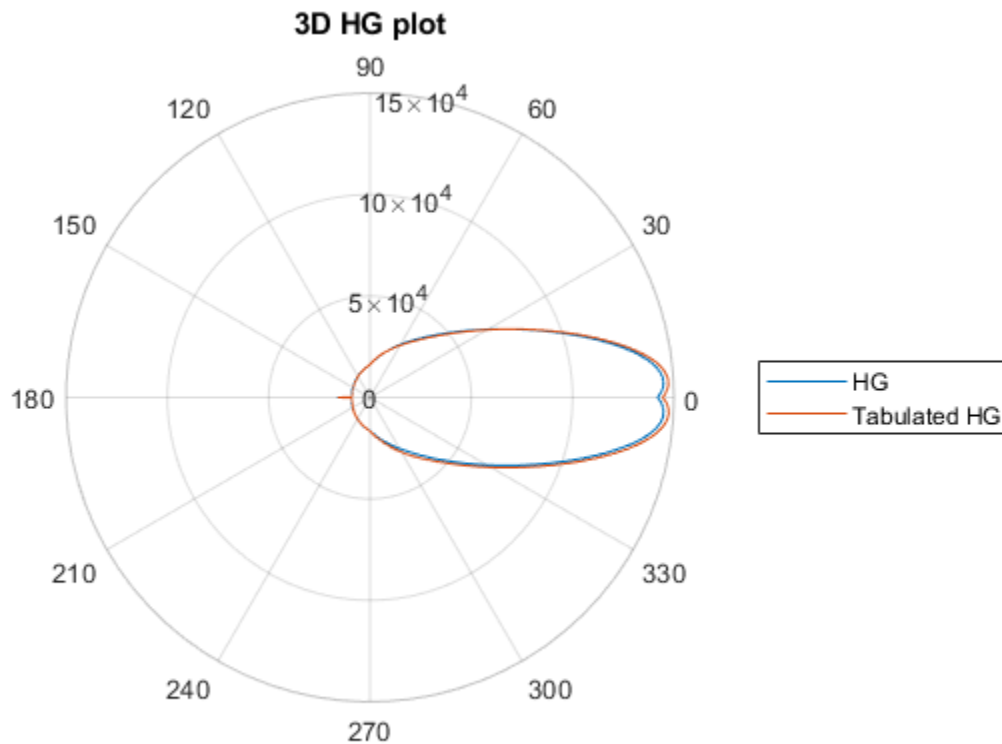
Elapsed time is 631.047420 seconds.
Elapsed time is 629.398193 seconds.

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