

Mini-Matlab Lesson 12a: Spherical function

The code is from the code by D.L. Chen ('help spharm2' in Matlab)

```
function [x, y, z] = graphics_spharm

% Define constants.
degree = 6;
order = 1;

% Create the grid
delta = pi/40;
theta = 0 : delta : pi; % altitude
phi = 0 : 2*delta : 2*pi; % azimuth
[phi,theta] = meshgrid(phi,theta);

% Calculate the harmonic
Ymn = legendre(degree,cos(theta(:,1)));
Ymn = Ymn(order+1,:)' ;
yy = Ymn;
for kk = 2: size(theta,1)
    YY = [YY Ymn];
end;
yy = yy.*cos(order*phi);

order = max(max(abs(yy)));
rho = 5 + 2*yy/order;

% Apply spherical coordinate equations
r = rho.*sin(theta);
x = r.*cos(phi); % spherical coordinate equations
y = r.*sin(phi);
z = rho.*cos(theta);
```