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function [ xy ] = sigmaEllipse2D( mu, Sigma, level, npoints )
%SIGMAELLIPSE2D generates x,y-points which lie on the ellipse
 describing
% a sigma level in the Gaussian density defined by mean and
 covariance.
%
%Input:
% MU [2 x 1] Mean of the Gaussian density
% SIGMA [2 x 2] Covariance matrix of the Gaussian density
% LEVEL Which sigma level curve to plot. Can take any positive value,
% but common choices are 1, 2 or 3. Default = 3.
% NPOINTS Number of points on the ellipse to generate. Default = 32.
%
%Output:
% XY [2 x npoints] matrix. First row holds x-coordinates, second
% row holds the y-coordinates. First and last columns should
% be the same point, to create a closed curve.
%Setting default values, in case only mu and Sigma are specified.
if nargin < 3
 level = 3;
end
if nargin < 4
 npoints = 32;
end
%Your code here
xy= zeros(2,npoints);
phi=linspace(0,2*pi,npoints);
for i=1:npoints
 xy(:,i)= mu + level * sqrtm(Sigma) * [cos(phi(i)), sin(phi(i))]';
end
end
```

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