Round Spiral Layer

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X = round_layer_spiral(N,r0,d,phi0,RES,layers,h,x0,y0,z0,phix,phiy,phiz,view)

This function generates a flat circular multilayer spiral - PCB Inductor geometry to be used as a coil. The coil will be generated with center in (0,0,0) in XY plane. It can be moved using the x0,..,phix... parameters

Parameters

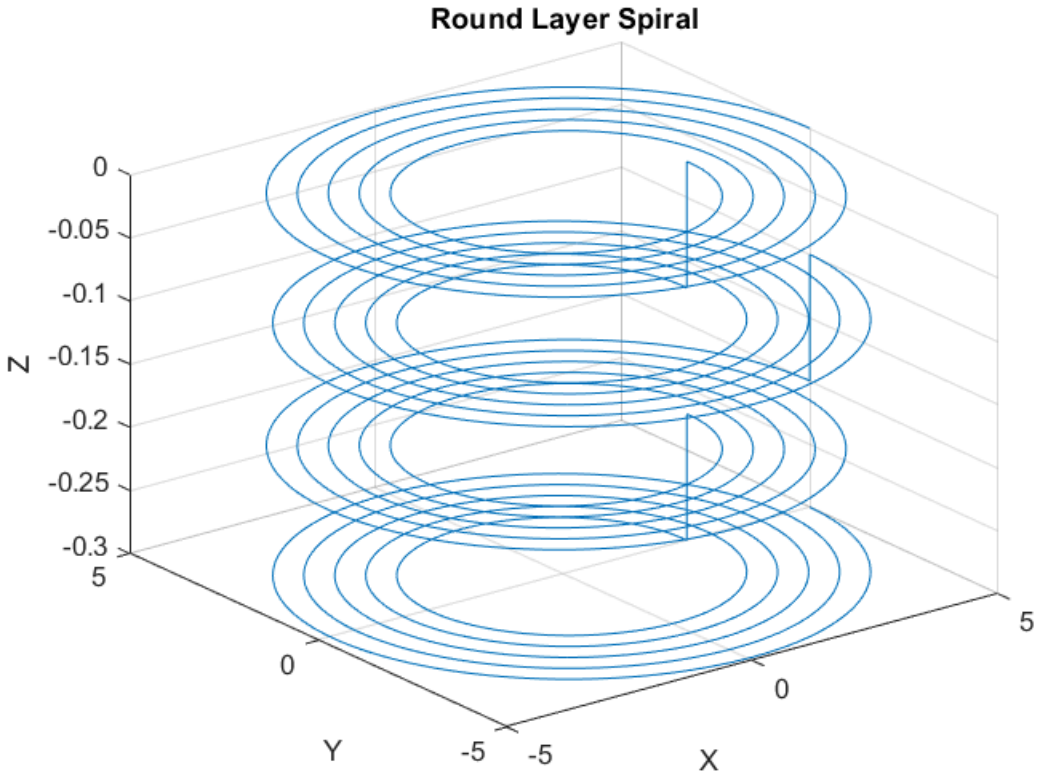
- @param **N** Number of Turns
- @param **r0** External radius of the coil
- @param **d** Distane bewtween turns
- @param **phi0** Angle at which the turns start
- @param **RES** Number of nodes of the Geometry (Discretization)
- @param **layer** Number of layers of the Geometry
- @param **h** Distance between layers of the Coil
- @param **x0** Center position X
- @param **y0** Center position Y
- @param **z0** Center position Z
- @param **phix** Turn respect X axis
- @param **phiy** Turn respect Y axis
- @param **phiz** Turn respect Z axis
- @param **view** Optional parameter, if true generates figure with geometry
- @retval **X** Geometry nodes

Code

```
function X =
 round_layer_spiral(N,r0,d,phi0,RES,layers,h,x0,y0,z0,phix,phiy,phiz,view)
 Rx=[1,0,0;0,cos(phix),-sin(phix);0,sin(phix),cos(phix)];
 Ry=[cos(phiy),0,sin(phiy);0,1,0;-sin(phiy),0,cos(phiy)];
 Rz=[cos(phiz),-sin(phiz),0;sin(phiz),cos(phiz),0;0,0,1];
 X=[];
 for i=1:1:layers
  if mod(i,2)==1 %Assures the correct direction of the turns
```

```
    X=[X,round_spiral(N, r0, d, phi0, RES, 0, 0, -h*(i-1), 0, 0, 0,
  false)];
   else
    X=[X,fliplr(round_spiral(N, r0, d, phi0, RES, 0, 0, -h*(i-1), pi,
  0, 0, false))];
   end
  end
  for i=1:size(X,2)
   X(:,i)=transpose(Rx*[X(1,i);X(2,i);X(3,i)]);
   X(:,i)=transpose(Ry*[X(1,i);X(2,i);X(3,i)]);
   X(:,i)=transpose(Rz*[X(1,i);X(2,i);X(3,i)]);
   X(:,i)=X(:,i)+[x0;y0;z0];
  end
  if nargin>13
   if view
    plot3(X(1,:),X(2,:),X(3,:))
    grid on
    xlabel('X')
    ylabel('Y')
    zlabel('Z')
    title('Round Layer Spiral');
   end
  end
end
```

Geometry



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