
Square Spiral Layer

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`X = square_layer_spiral(N,A,L,d,layers,h,x0,y0,z0,phix,phiy,phiz,view)`

This function generates a flat rectangular 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 **A** Width of the coil
- @param **L** Height of the coil
- @param **d** Distane bewtween turns
- @param *layers*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

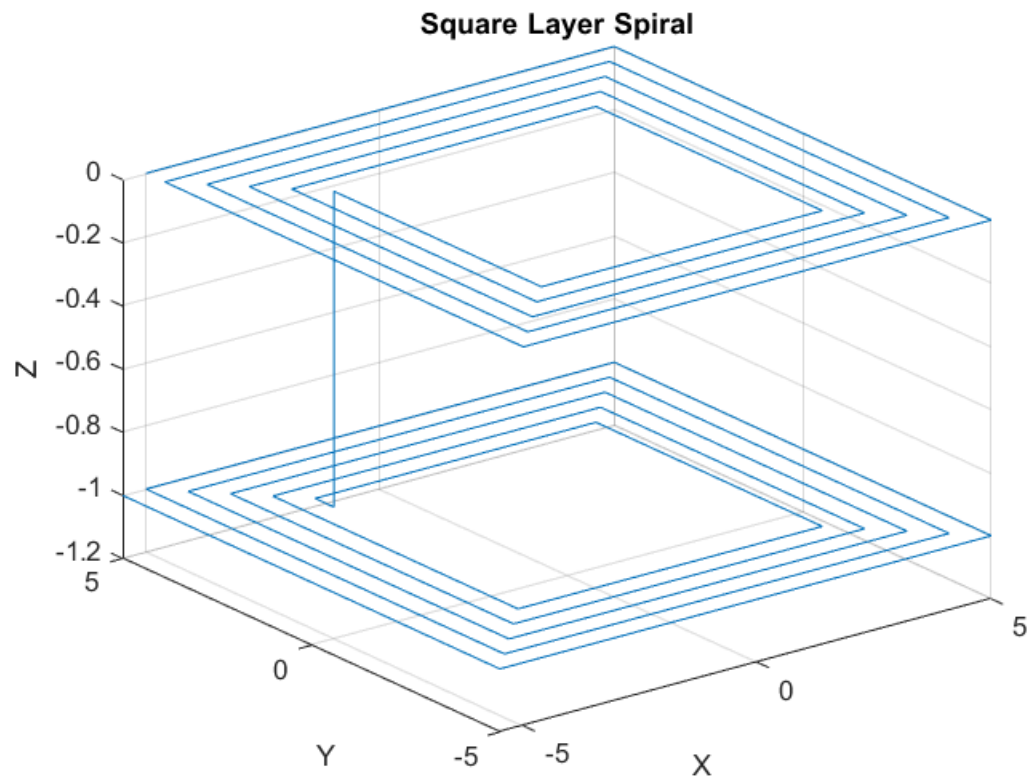
```
function X =  
square_layer_spiral(N,A,L,d,layers,h,x0,y0,z0,phix,phiy,phiz,view)  
Rx=[1,0,0;0,cos(phix),-sin(phix);0,sin(phix),cos(phix)];  
Ry=[cos(phiy),0,sin(phiy);0,1,0;-sin(phiy),0,cos(phiy)];  
Rz=[cos(phiz),-sin(phiz),0;sin(phiz),cos(phiz),0;0,0,1];  
X=[];  
X=[X,square_spiral(N,A,L,d,0,0,0,0,0,0,false)];  
for i=2:1:layers  
    if mod(i,2)==1 %Assures the correct direction of the turns  
        Xaux=X(:,size(X,2))+[0;0;-h];
```

```

    X=[X,Xaux,square_spiral(N,A,L,d,0,0,-h*(i-1),0,0,0,false)];
else
    Xaux=fliplr(square_spiral(N,A,L,d,0,0,-h*(i-1),pi,0,0,false));
    Xaux(:,1)=X(:,size(X,2))+[0;0;-h];
    X=[X,Xaux,Xaux(:,size(Xaux,2))+[-d;0;0],Xaux(:,size(Xaux,2))+[-
d;L;0]  ];
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>12
    if view
        plot3(X(1,:),X(2,:),X(3,:))
        grid on
        xlabel('X')
        ylabel('Y')
        zlabel('Z')
        title('Square Layer Spiral');
    end
end
end
end

```

Geometry



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