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# Square Spiral

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

This function generates a flat rectangular 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 **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_spiral(N,A,L,d,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];
xc=-A/2;
yc=+L/2;
for i=1:N
    X(1,(5*i-4))=xc+(i-1)*d;
    X(2,(5*i-4))=yc-(i-1)*d;
    X(3,(5*i-4))=0;
    X(1,(5*i-3))=xc+A-(i-1)*d;
    X(2,(5*i-3))=yc-(i-1)*d;
    X(3,(5*i-3))=0;
    X(1,(5*i-2))=xc+A-(i-1)*d;
```

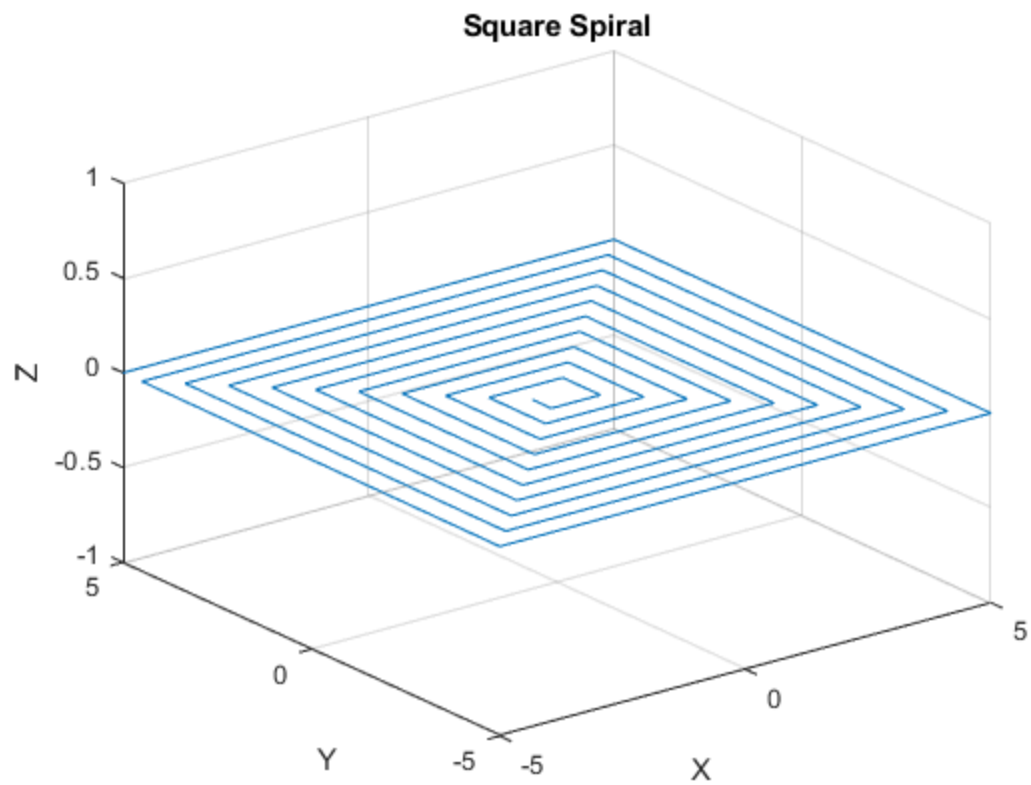
```

X(2,(5*i-2))=yc-L+(i-1)*d;
X(3,(5*i-2))=0;
X(1,(5*i-1))=xc+(i-1)*d;
X(2,(5*i-1))=yc-L+(i-1)*d;
X(3,(5*i-1))=0;
X(1,(5*i))=xc+(i-1)*d;
X(2,(5*i))=yc-i*d;
X(3,(5*i))=0;
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>10
    if view
        plot3(X(1,:),X(2,:),X(3,:))
        grid on
        xlabel('X')
        ylabel('Y')
        zlabel('Z')
        title('Square Spiral');
    end
end
end

```

# Geometry



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