

# Cylinder Scattering

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Certain electromagnetic scattering problems have analytical solutions. In the cylindrical coordinate, the solutions are expressed in the series form of the products of the Bessel functions and exponential functions. This package contains the code that implements the field solutions as

- a) a planewave scattered by a conducting cylinder and a dielectric cylinder
- b) a cylindrical wave from a line source scattered by a conducting cylinder and a dielectric cylinder.

The solutions to these problems are available in [Balanis1989] and [Harrington2001].

The following scripts demonstrate the use of this package:

```
plotConductingCylinderTotalFieldUnderPlaneWave
```

```
plotDielectricCylinderTotalFieldUnderPlaneWave
```

```
plotConductingCylinderTotalFieldUnderLineSource
```

```
plotDielectricCylinderTotalFieldUnderLineSource
```

The code returns the plots of the total field strength, Poynting vector, and phase. It may serve to verify the implementations of the numerical methods to solve the Maxwell equations in 2D.

Reference: