Analytic wave observations

# Definition of the equation

The Helmholtz equation may be written as following:

|  |  |
| --- | --- |
|  | (1) |

The equation (1) has the following analytic solution in two dimensions that satisfies all the above conditions:

|  |  |
| --- | --- |
|  | (1) |

The solution is a plane wave in 2 dimensions.

# Influence of the k

The influence of is on the frequency of the oscillation. , and the second ratio shows that increase with, the angular frequency.

The Figure 1 that shows the representation of the curve in 2 dimensions with increasing k illustrates this idea.

# Influence of the angle

The parameter gives the orientation of the plane wave. More precisely, for a the displacement plane wave is oriented along the abscissa axis in the direction of the positive x and rotate in the direction of the y ordinate axis. The Figure 2 illustrates this idea.

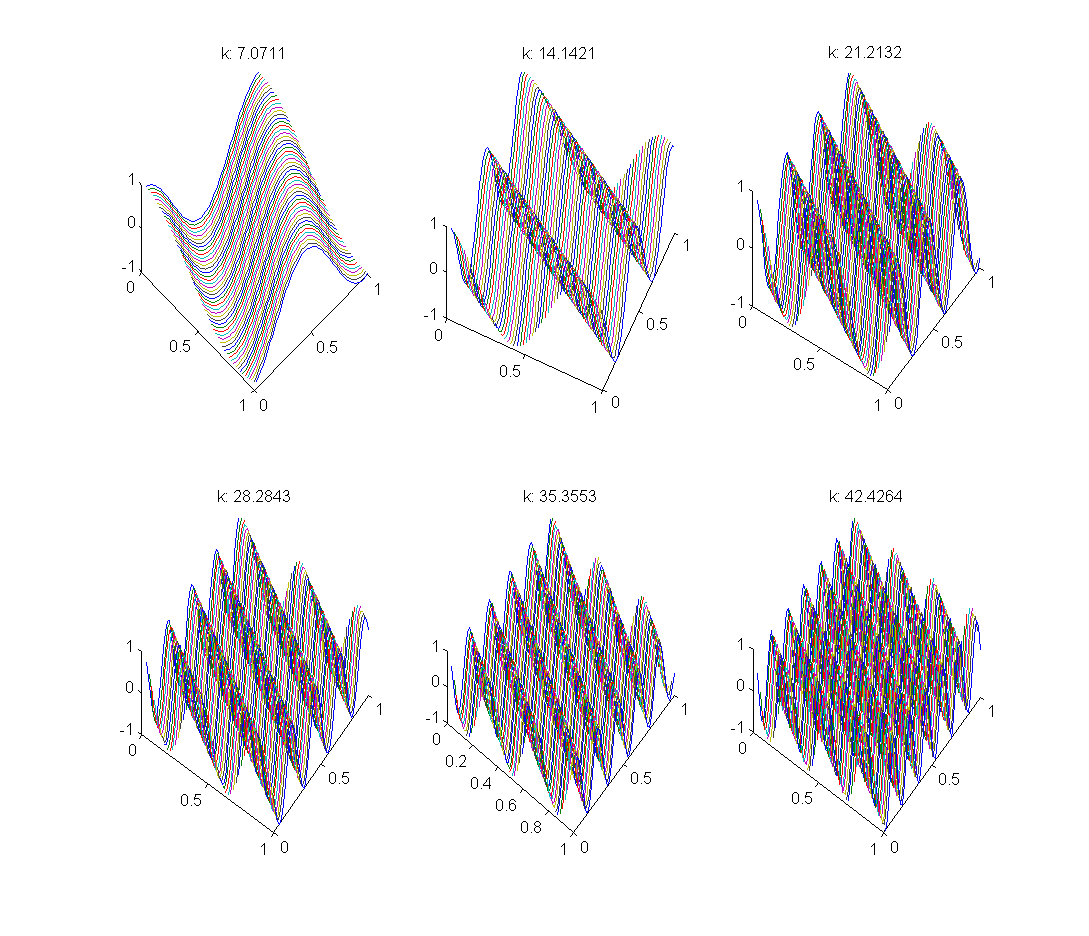


Figure - 2D Helmholtz equation for increasing k

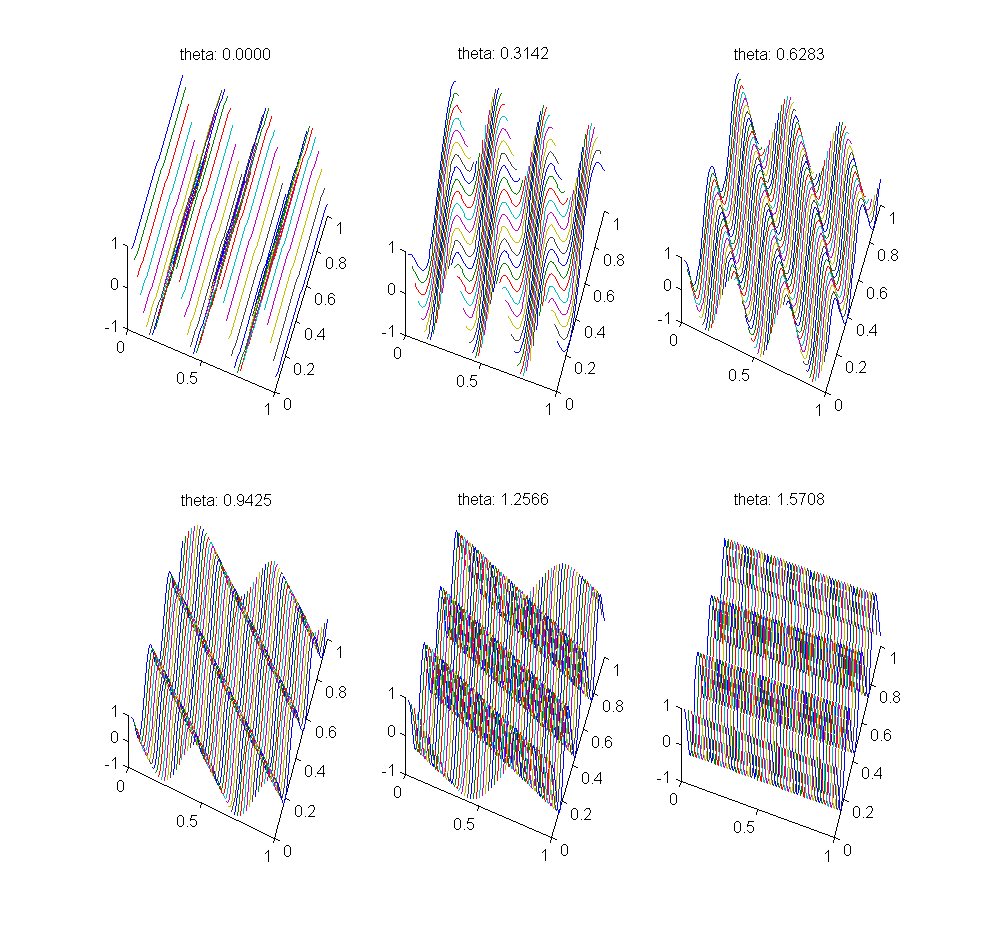


Figure - 2D Helmholtz equation for increasing theta