BESSEL BEAM AND ITS' CHARACTERISTICS

A Bessel beam is a kind of electromagnetic field, whose amplitude is described by a Bessel function of the first kind.

Two foremost characteristics of Bessel Beam:
• As it propagates, the intensity of the beam won't change along the propagation direction.
• Bessel beams are also self-healing, which means non-diffraction.

Application: Low BER communication link results from the no-divergence beam.

DURRIN’S SET UP – ANNULAR SLIT

The first set up to generate quasi- Bessel beam proposed by Durnin[1].

NEW PATHWAY OF BESSEL BEAM GENERATED BY CONCAVE LENS AND AXICON SYSTEM

Combine the merits of Durnin’s set up and Herman’s set up: longer the non-diffraction distance, make full use of the beam energy as well.

ABCD Matrix for this set up:

**NEW PATHWAY OF BESSEL BEAM GENERATED BY CONCAVE LENS AND AXICON SYSTEM**

Combine the merits of Durnin’s set up and Herman’s set up: longer the non-

Simulation Result:

**HERMAN’S SET UP – AXICON**

To make full use of the beam energy so that get a high SNR of a receiver signal.

FUTURE WORK:

We still need to discover new method to generate longer non-diffraction distance Bessel Beam so that it can be applied into real practice, actually, we should put our concentration on the longer distance as well as energy utilization efficiency.

References: