



Experiment No. -

AIM To analyze the effect of cluster size on system capacity.

Theory The major attributes of cellular communication systems are large coverage area, effective spectrum utilization and enhanced system capacity. The total number of channels available in a cellular system is finite because of limited RF spectrum allocation. The capacity of a cellular system is defined by the total number of RF channels available. To increase the capacity available RF channels are reused at some distance, by forming the cluster of size $N=3, 4, 7$.

- Suppose cellular system is having K duplex channel
- Cluster of size $N=3, 4, 7$
- Number of channels per cell $J = K / N$
- To cover the given area cluster is repeated M times
- System capacity = $M \cdot K$

Problem A 40 MHz frequency spectrum is allocated to a wireless FDD cellular system which uses 30KHz simplex Channel to provide full duplex channel. Calculate number of channels per cell if system uses cluster size 3, 4 and 7. Area covered by system is 270 sq.km with cell radius 2 km. Calculate system capacity for cluster size 3, 4 and 7.

Answer the following questions

1. What is FDD.
2. Define cluster and draw cluster of size $N=3$ & 7, Repeat it 3 times.
3. Explain frequency reuse concept.

Result analysis and conclusion