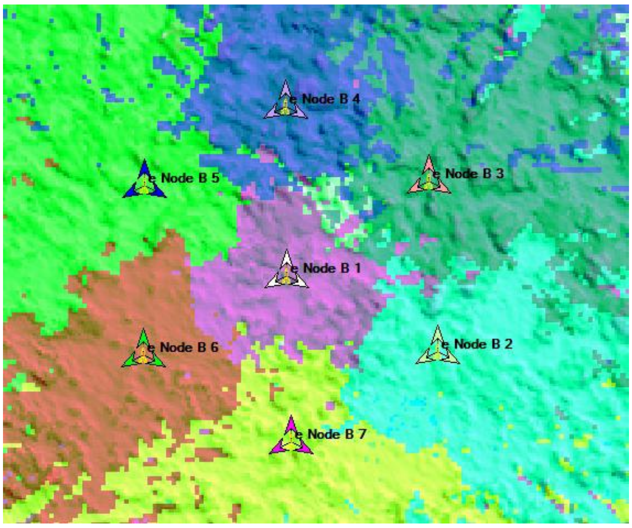

Figure 4: e Node B Coverage

In figure 4 it can be seen that the region between e Node B 1, 3 and 4 there is a region which is not covered by any of the e Node Bs. So in the practical scenario it is quite difficult have wide area coverage with proposed system since the geographic as well as environmental factors including vegetation have great influence in the signal level. Hence comes the relevance of HetNet system. So a heterogeneous network with femtocells can deliver signals at that location. So by placing such a HetNetfemtocell or picocell at the location where e Node B signal level is very low and we can improve the system. Effective use of resources with femtocell network can improve the throughput as well as capacity. Thus the low signal level ranges can be improved by femtocells which are proposed by 3GPP in its technical specifications. Tower mounted amplifier (TMA) and e Node Bs e Node B generated femto access points can also be placed at those locations. These two can improve the communication facility at wireless domain in low signal level or coverage free locations in practical scenario.

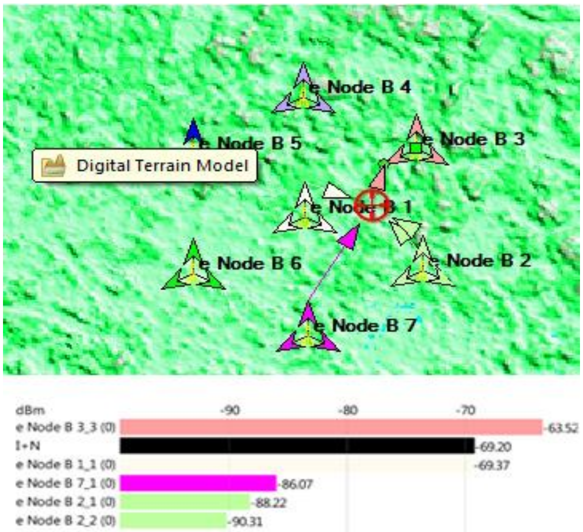

Figure 5: Point analysis for signal strength & I+N

In figure 5 we take point analysis in a particular location so as to calculate the signal level and interference level at that point. In point analysis we take point in the 1-tier trisector system in between e Node B 1, 3 and 2. While calculating the signal level it can be seen that the third sector of e Node B 3 serves that location with it coverage. So all users in that location will be served by that e Node B. So the signal level at that point is -63.52 dB.

The same location will be covered by many other e Node Bs. In this scenario the first sector of e Node B 1, first sector of e Node B 7, first and second sector of e Node B 2 have signals with dominant power at that location. So this e Node Bs makes interference at that point we considered. The total interference added u with noise at that location will be -69.20 dBm. From this point it is clear that we can calculate, operate, and make observation as well as function calculation in a mobile communication with great precision as well as good statistics the mobile signal level strength as well as interference added u with noise. So practically the Shannon-Hartley law can be implemented by the calculation of SINR. Thus throughput evaluation in practical sense can be implemented and evaluated. Using this calculation we can implement a better system with interference calculation. The signal levels for other e Node Bs -80 to -95 dBm except e Node 1.

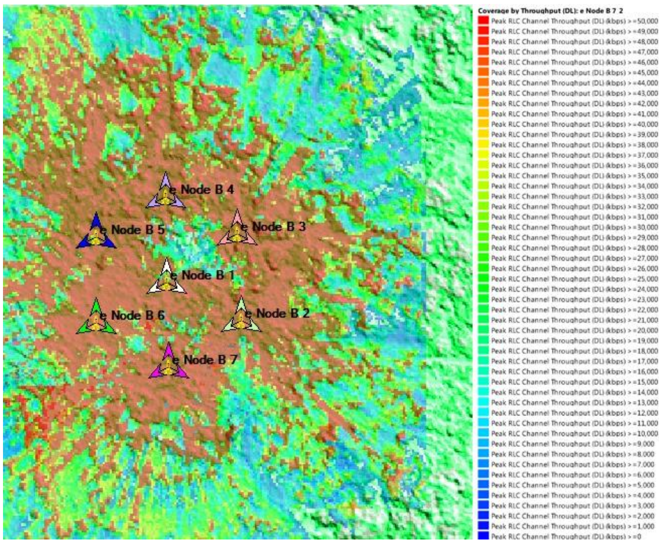

Figure 6: LTE Throughput analysis in terms of DL data rate

In fig: we calculate the throughput in terms of uplink (UL) and downlink (DL) data rates. Here we only consider the downlink only since it is based on OFDM systems. Thus the calculations of downlink throughput have great importance since in LTE implementation in practical sense we have to ensure the terrain based systems to optimize the calculation of capacity of each cell in a 1 tier, trisector cluster of LTE cells.

The maximum capacity that can be ensured is 50 Mbps around an e Node B and is getting down as per the distance increases and that can be seen in fig. . From the fig, it is clear that as per the distance increases the capacity is getting down. It is due to the fact that, as per the distance from e Node B increases the path loss gets increased which will make limitations in bit rate. Here the minimum data rate offered at the cell centre region is 50 Mbps (overall) and at the cell edge region is at most 7 Mbps.

Using the prediction tool, we worked as an RF engineer assigned to design cell structure for mobile communication

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networks with great responsibilities. RF planning is the most important process in developing the mobile communication infrastructure for each vender in thus emerging era of wirelesses. The 5G technology proposes a worldwide wireless web (wwww) and LTE can be considered as the milestone for this explosion of wireless world

5. Conclusion

Kerala terrain is considered with Kollam, Pathamnathitta, Kottayam, Alappuzha and Idukki districts in prior. Since till 2015 august no vendor provide the LTE technology here in Kerala. Gods own country is of with Western Ghats as well as Arabian sea surrounded lad as a result here the altitude dramatically changes with clutter. In this high and low as well as lads with a altitude almost sae as that of Western Ghats. The RF planner have to look these changes while place a e Node B at a particular position

Each e Node B and each sector in that is configured and allocation of physical resource blocks PRBs are done in such a way that it can provide maximum capacity with the existing systems. The expansion of existing infrastructure will lead to increase in capital expenditure. Thus the optimum implementation in practical sense and with an eye towards the Kerala terrain must be one with lesser CAPEX (Capital Expenditure).The Kerala terrain with specific clutter and vegetation with drastic altitude changes we can ensure the LTE technology can provide better data rates. In the present scenario, the LTE implemented. Vendors like BharatiAirtel can provide a minimum of 3 Mbps speed with limited infrastructure in Indian cities Bangalore, Chennai, Delhi etc. So as an emerging mobile technology LTE has a bright future in Indian terrain.

Since some geographic areas with lower altitudes, it's difficult to serve the users at that locations which is already see in results of the prediction tool. So while making an RF plan we have to consider the terrain regardless of technical specifications.

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