

## **ABSTRACT**

*Radio over Fiber (RoF) is a combination of wireline and wireless communications, so that in its architecture there is a transceiver component of wireless communication that is BTS and using optical fiber transmission media. In fact, high data rates can only be achieved in cellular networks by reducing cell sizes to efficiently use re-use frequencies. However, handover on small cells also means more frequent handover will occur. Mobile IP Technology is not a good protocol for delivering high speed links to fast-moving users since Mobile IP does not work well with the frequent handover.*

*In this final project, RoF network will be design in sub urban area working on 2.4 GHz frequency for railway transportation user by joint angle-frequency estimation algorithm (JAFE algorithm) and Moving Extended Cell method. The analysis is done by designing the quantity of cells to be used and theoretically placing the remote antenna unit (RAU).*

*Using the joint angle-frequency estimation algorithm (JAFE algorithm) and Moving Extended cell method is able to get the strength of the received signal and design the range of cells to obtain the appropriate capability in the straight-line passenger train.*

*Keywords : Radio Over Fiber, joint angle-frequency estimation, Moving Extended cell, Atoll Planing Software*