

MARWA MOUTAZ ISMAIEEL . RADIO COVERAGE OF CELLULAR MOBILE NETWORK IN BAGHDAD CITY. UNIVERSITY OF TECHNOLOGY.

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Abstract

In this work; a virtual cellular network was built for Baghdad city by using Switched Beam Smart Antenna Technique SBSA in all cells. It has optimum coverage, minimum interference, minimum transmitted power and maximum capacity. This work is divided into two stages; in 1st stage: the coverage for one cell was extracted by changing the broadcast parameter for each cell for three different situations (free-space, smooth surface and multipath), In the latter a three path loss model were taken to show how the coverage can be changed by changing broadcast parameters and to find the best model that give an accurate result. Hata model is found to be the best model that gives precise consequences. MATLAB6.5 is used to simulate and present the results. "Broadcast parameter is taken from . "ISIA- Cell Company

In the 2nd stage; a cellular network of hexagonal cells was built by using MATLAB, and combined with Radio Mobile Program in order to distribute cells on it by using frequency reuse rule. SBSA was used with four beams per sector to cover Baghdad city in all Base Transceiver Stations BTS. Baghdad city was divided into eleven parts and cells were distributed on it by using frequency reuse equals to four. Baghdad city was built with four different elevation data layers in .order to have accurate and high resolution maps

While keeping the same range, the transmitted power was reduced by four which give low pollution and low power saving cost. Interference was reduced by four, by keeping the same Carrier to Interference Ratio C/I ratio the frequency reuse was reduced from seven to four. Keeping the same cell area the capacity for the whole network was increased by 75%. Utilizing the higher gain offered by SBSA while reducing power. Vast areas can be covered by using a minimum number of BTS, in extreme areas of Baghdad city, one BTS cover areas of 7 BTS.

Keywords: Switched Beam Smart Antenna Technique (SBSA), Radio Mobile (RM) , Baghdad city , Smart Antenna (SA), Path Loss Models , Radio Coverage.

