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| LTE with Dynamic Spectrum Access |
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LTE with Dynamic Spectrum Access

Prof Dr. Hebat-Allah Mourad

**Abstract:**

The frequency spectrum is a limited resource; the next generation of wireless communication systems such as LTE requires a bigger chunk of that spectrum. This project addresses the problem of limited spectrum access and tries to improve the spectrum usage to achieve better LTE physical layer characteristics.

The project aims at implementing the LTE physical layer and adding to it dynamic spectrum access capabilities using cognitive radio techniques on both the software and hardware levels. The project is divided into 3 parts, first simulating the LTE physical layer with dynamic spectrum access using Matlab/Simulink, secondly implementing some blocks on the Virtex-5 LXT FPGA ML505 Evaluation Platform, finally integrating the Matlab/Simulink blocks with the hardware blocks and testing the final product for the required output.

**CONCLUSION:**

In the LTE physical layer we were able to calculate the overall layer’s bit error rate and we used the transmitter of the LTE physical layer to create an environment to test the cognitive radio concept, we were able to reuse the frequency spectrum due to not sending data on it and due to deep fading in a certain location. We also implemented the channel and the Turbo decoder blocks on the FPGA to speed the simulation to test the system faster. The whole system wasn’t integrated together.