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| HSPA Evolution (HSPA+) |
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HSPA Evolution (HSPA+)

Dr. Omar Ahmed Nasr

**Abstract:**

Our project is mainly in digital communication. In this project we have learned how to simulate a digital communication system on MATLAB and how to implement this system as hardware on FPGA kit.

In this project we made a MATLAB simulation to the uplink Physical layer of HSPA+ release following the 3GPP standards, we almost brought out to light most of this uplink physical layer.

Here, we implemented the transmitter and receiver blocks as a separated MATLAB functions, also we have modeled a channel in our project which was a multipath Rayleigh fading channel and added to it AWGN.

About the hardware implementation we used the Verilog HDL “Hardware Description

Language” and we implemented each block separately as separated module then linked them with each other using modules FPGA kit.

**CONCLUSION:**

Verification and results in both MATLAB simulation modeling and hardware implementation as we took an example from the standard and compared our results with the standard results, also you can find the BER curves.

**Future work**

* Implement the remaining transport channels
* Implement the downlink of the system
* Complete hardware design
* Pulse shaping
* Downlink system
* More testing methods (BIST,..etc)

Note:

BIST means Built-In Self Test