

Karol Wadolowski

ECE 408: Wireless Communications

Project – Standard Simulation Proposal

Proposal

The standard I want to implement some of the PHY layer functionality from is the Global System for Mobile (GSM). The two things I would want to implement are a Full Rate Speech Traffic Channel (TCH/FS) and a Full Rate Data Traffic Channel (TCH/F9.6). Each of these two would have error correction codes (ECC) (different specifications for both). Both require interleaving between frames, and both do it differently. The encryption portion of the standard will not be implemented. After interleaving the data Gaussian Minimum Shift Keying (GMSK), a form of differential encoding, will be implemented to transmit the symbols. On the receiver end all this will be undone to retrieve the sent data.

Some things of note: TCH/FS and TCH/F9.6 allocate bits differently and thus different ECCs must be used and implemented in the simulation and thus on the receiving end as well. The interleaving is different for the speech and data as well, speech is within a frame while data is multiframe. So, in effect this will be two simulations of two different types of info for the standard (two BER curves).

The resources I plan on using are Rappaport (contains a section on GSM) and <https://www.3gpp.org/DynaReport/45-series.htm>. Rappaport has some easy to read condensed portions of the standard while the link has the full specifications.

Feedback on the proposal would be greatly appreciated.