

5G Coding Options

The 5G Coding requirements may be broken down to:

- Spectral efficiency to enable higher data rate
- Energy efficiency to enable longer battery life time and reduce latency
- Exploit multi terminal to achieve the above

4G spectral efficiency is 4.08 and 16.32 bit/s/Hz for SISO and MIMO, respectively. It needs to be improved by an order of magnitude.

4G energy efficiency is about 6nJ/bit and it needs to be improved at least by an order of magnitude.

In order to reduce the computational coding overhead, in the receiver, the decoding could take place when SNR is below certain threshold. In the case of high SNR, the decoding should not need be required.

There are number of coding schemes under investigations that does not meet all of the above requirements, yet has some advantages over existing 4G coding, namely;

- Spatially Coupled (Convolutional) LDPC Codes
- Non-binary LDPC codes
- Sparse Regression Codes
- Polar Codes