1154-94-807 **Doel A Rivera*** (driveralaboy@pucpr.edu), HC 08 Box 278, Ponce, PR 00731-9704. *Codes from Cayley Graphs.* Preliminary report.

Low Density Parity Check Codes (LDPC Codes) are constructed from sparse binary matrices. Most binary matrices chosen at random offer good decoding performance and coding gains. However, if LDPC codes are constructed from richly structured mathematical objects such as Euclidean finite geometries, then they offer better decoding performance due to the code's underlying structure. Our aim is to construct LDPC codes from different Cayley graphs in order to improve upon the performance of current codes, like those used in the ATSC 3.0. In our work, we study LDPC codes from Cayley graphs and their line graphs. In the case of line graphs, we use the classical LDPC code construction. As the edge vertices of a line graph are adjacent to two vertices, we also take advantage of this fact to develop a path-based decoder. We compare our LDPC code performance with other LDPC codes. We also consider applications of codes from our Cayley graphs to Locally Recoverable Codes. This work was conducted under the supervision of Prof. Fernando Piñero, of the PR-TN REU in Probabilistic Combinatorics and Algebraic Coding Theory. (Received September 10, 2019)