1023-L1-1812 **Matthew Ferrara**, Department of Mathematical Sciences, Rensselaer Polytechnic Institute, Troy, NY 12180, **Michael Kupferschmid**, Academic and Research Computing, Rensselaer Polytechnic Institute, Troy, NY 12180, and **Gregory E Coxson*** (gcoxson@ieee.org), TSC Washington Office, 962 Wayne Avenue, Suite 800, Silver Spring, MD 20832. *Statistics of the Peak Sidelobe Distribution for Binary Codes.* Preliminary report.

The minimum achievable peak autocorrelation sidelobe level for binary codes of a given length N is of interest in applications such as radar and communications. The typical way to determine it is to perform an exhaustive search over the space of N-length codes. However, this approach is practical for only relatively low code lengths (currently on the order of 80 or less), motivating the search for ways to derive accurate estimates for higher lengths.

The approach we have taken is to determine the PDFs for Peak Sidelobe Level (PSL) for as many code lengths as possible. Unlike the determination of best achievable PSL, which can leverage available knowledge to prune the search tree, our computations have involved truly exhaustive searches. The results we present extend to length 30, which should be useful for those interested in this problem. Furthermore, these results display promising convergence properties for moments of the PDF. We chose to study mean, variance, skewness and kurtosis, although it is possible to compute higher moments.

Our results suggest that it is possible to use PDF moments from lower code lengths to predict those for higher code lengths. This paper shows some comparisons of moment predictions to those calculated from exhaustive search results. In addition, we develop a probabilistic model for PSL distribution estimation. The challenges in using these estimates to determine minimum achievable PSL have led to some new questions, and avenues for future research. (Received September 26, 2006)