1145-94-1098   **Kevin M. Byrnes*** (`dr.kevin.byrnes@gmail.com`). *Circuit Codes With Long Bit Runs.*

A circuit code of spread k is a simple cycle C in the graph of the d-dimensional hypercube $I(d)$ with the property that for any vertices $x, y \in C$, $d_{I(d)}(x, y) \geq \min\{d_C(x, y), k\}$. One application of circuit codes is as error-correcting codes, so it is of interest to find the maximum length of a circuit code in dimension d with spread k, $K(d, k)$. However, finding closed form expressions for $K(d, k)$ for classes of (d, k) combinations is extremely rare. In this work we build upon previous results of Singleton, Douglas, Deimer, and others to derive a new upper bound on $K(d, k)$ for a class of symmetric circuit codes with long bit runs (sequences of distinct transitions). We also present a construction that we conjecture (after extensive numerical testing) achieves this upper bound, suggesting a new closed form expression for $K(d, k)$ on this class of codes. (Received September 18, 2018)