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**G. Eric Moorhouse** (moorhous@uwyo.edu), **Shuying Sun\*** (shuying@udel.edu) and **Jason Williford** (jwillif1@uwyo.edu). *The Eigenvalues of the Graphs  $D(4, q)$* . Preliminary report.

The graphs  $D(k, q)$  give the best known bounds on extremal problems with forbidden even cycles, and are denser than the well-known graphs of Lubotzky Phillips, Sarnak and Margulis. Despite this, little about the spectrum and expansion properties of these graphs is known. In this paper we find the spectrum for  $D(4, q)$ , the smallest open case. For each prime power  $q$ , the graph  $D(4, q)$  is  $q$ -regular graph on  $2q^4$  vertices, all of whose eigenvalues other than  $\pm q$  are bounded by  $2\sqrt{q}$ . Accordingly, these graphs are good expanders, in fact very close to Ramanujan. (Received August 19, 2016)