

## Edge-Regular Graphs with $\lambda=2$

Vincent Glorioso\*, Peter Johnson, Auburn University

A graph  $G$  is edge-regular with parameters  $(n, d, \lambda)$  if and only if  $|V(G)| = n$ ,  $G$  is regular of degree  $d > 0$ , and for any pair  $u, v$  of adjacent vertices in  $G$ ,  $u$  and  $v$  have exactly  $\lambda$  common neighbors. We look into the existence and structure of edge-regular graphs with parameters  $(n, d, 2)$ , especially such graphs satisfying additional conditions such as: the subgraph induced by each open neighborhood in  $G$  is  $\frac{d}{3}K_3$ .

Keywords: edge-regular graphs