On some new regular digraphs from finite groups

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In this talk, we describe a construction of certain regular digraphs using finite simple groups. We introduce the notion of orbit matrices of digraphs and point out some interesting results obtained using specific linear groups. In particular, we present the first example of a directed strongly regular graph with parameters (63,11,8,1,2) along with several other new directed strongly regular graphs obtained from finite simple groups. The talk is based on the papers [1, 2, 3].

References

[1] A. E. Brouwer, D. Crnković, A. Švob, A construction of directed strongly regular graphs with parameters (63,11,8,1,2), *Discrete Math.* 347 (2024), 114146, 3 pages.

[2] A. E. Brouwer, D. Crnković, A. Švob, M. Zubović Žutolija, Some directed strongly regular graphs constructed from linear groups, *Appl. Algebra Engrg. Comm. Comput.*, to appear.

[3] D. Crnković, A. Švob, T. Zrinski, Construction of directed strongly regular graphs via their orbit matrices and genetic algorithm, `https://arxiv.org/abs/2412.14787`.