

ISOLATION OF GRAPHS

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Given a set \mathcal{F} of graphs, we call a copy of a graph in \mathcal{F} an \mathcal{F} -graph. The \mathcal{F} -isolation number of a graph G , denoted by $\iota(G, \mathcal{F})$, is the size of a smallest subset D of the vertex set of G such that the closed neighbourhood $N[D]$ of D intersects the vertex sets of the \mathcal{F} -graphs contained by G (equivalently, $G - N[D]$ contains no \mathcal{F} -graph). If \mathcal{F} consists of a 1-clique, then $\iota(G, \mathcal{F})$ is the *domination number* of G . If \mathcal{F} consists of a 2-clique, then $\iota(G, \mathcal{F})$ is the *vertex-edge domination number* of G . The study of the general \mathcal{F} -isolation problem was introduced by Caro and Hansberg [6, 7]. This study is expanding very rapidly. A brief account of its development and of the speaker's recent work and collaborations in this field will be provided [1, 2, 3, 4, 5]. The speaker's collaboration with members of University of Gdańsk was funded by a SEA-EU grant awarded by the University of Malta.

References

- [1] K. Bartolo, P. Borg, M. Dettlaff, M. Lemańska, and P. Żyliński, Isolation critical graphs under multiple edge subdivision. arXiv:2602.22980 [math.CO].
- [2] P. Borg, Isolation of regular graphs, stars and k -chromatic graphs. Discrete Mathematics 349 (2026), paper 114706.
- [3] P. Borg, Isolation of regular graphs and k -chromatic graphs. Mediterranean Journal of Mathematics 21 (2024), paper 148.
- [4] P. Borg, Proof of a conjecture on isolation of graphs dominated by a vertex. Discrete Applied Mathematics 371 (2025), 247–253.
- [5] P. Borg and Y. Caro, Results on three problems on isolation of graphs. arXiv:2602.22856 [math.CO].
- [6] Y. Caro and A. Hansberg, Isolation in graphs. Electronic Notes in Discrete Mathematics 50 (2015), 465–470.
- [7] Y. Caro, A. Hansberg, Partial domination - the isolation number of a graph. Filomat 31 (2017), 3925–3944.