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ON GRAPHS IN WHICH NEIGHBORHOODS OF VERTICES ARE STRONGLY REGULAR WITH PARAMETERS (85,14,3,2) OR (325,54,3,10)

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J. Koolen posed the problem of studying distance regular graphs in which neighborhoods of vertices are strongly regular graphs with nonprincipal eigenvalue at most t for a given positive integer t. This problem was solved earlier for $t = 3$. In the case $t = 4$, a reduction to graphs in which neighborhoods of vertices have parameters (352,26,0,2), (352,36,0,4), (243,22,1,2), (729,112,1,20), (204,28,2,4), (232,33,2,5), (676,108,2,20), (85,14,3,2), or (325,54,3,10) was obtained. In the present paper, we prove that a distance regular graph in which neighborhoods of vertices are strongly regular with parameters $(85, 14, 3, 2)$ or $(325, 54, 3, 10)$ has intersection array $\{85, 70, 1; 1, 14, 85\}$ or $\{325, 270, 1; 1, 54, 325\}$. In addition, we find possible automorphisms of a graph with intersection array $\{85, 70, 1; 1, 14, 85\}$.

Keywords: strongly regular graph, locally $\mathcal{X}$-graph, automorphism of a graph.

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