LARGE VERTEX-SYMMETRIC HIGMAN GRAPHS WITH $\mu = 6$

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A strongly regular graph with $v = \binom{m}{2}$ and $k = 2(m - 2)$ is called a Higman graph. In such a graph, the parameter μ is 4, 6, 7, or 8. If $\mu = 6$, then $m \in \{9, 17, 27, 57\}$. Vertex-symmetric Higman graphs were classified by N. D. Zyulyarkina and A. A. Makhnev (all of these graphs turned out to have rank 3). A program of classification of vertex-symmetric Higman graphs is implemented. Earlier Zyulyarkina and Makhnev found vertex-symmetric Higman graphs with $\mu = 6$ and $m \in \{9, 17\}$. In the present paper, vertex-symmetric Higman graphs with $\mu = 6$ and $m \in 27, 57$ are studied. It is interesting that the group $G/S(G)$ may contain two components L and M. In the case $m = 27$, we have $M \cong A_5, A_6$ and $L \cong L_3(3)$; in the case $m = 57$, we have either $M \cong PSp_4(3)$ and $L \cong L_3(7)$ or $M \cong A_6$ and $L \cong J_1$.

Keywords: distance-regular graph, graph automorphism.

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