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A characterization of $C_2(q)$ where $q > 5$

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Abstract: The order of every finite group G can be expressed as a product of coprime positive integers $m_1, ..., m_t$ such that $\pi(m_i)$ is a connected component of the prime graph of G. The integers $m_1, ..., m_t$ are called the order components of G. Some non-abelian simple groups are known to be uniquely determined by their order components. As the main result of this paper, we show that the projective symplectic groups $C_2(q)$ where $q > 5$ are also uniquely determined by their order components. As corollaries of this result, the validities of a conjecture by J.G. Thompson and a conjecture by W. Shi and J. Be for $C_2(q)$ with $q > 5$ are obtained.

Keywords: prime graph, order component, finite group, simple group
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