

Symmetric graphs of prime valency

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A graph $\Gamma = (V, E)$ is called a Cayley graph of some group T if the automorphism group $Aut(\Gamma)$ contains a subgroup T which acts on regularly on V . If the subgroup T is normal in $Aut(\Gamma)$ then Γ is called a normal Cayley graph of T . Let r be an odd prime. Fang et al. [On locally primitive Cayley graphs of finite simple groups, J. Combin. Theory Ser. A 118 (2011), 1039-1051] proved that, with a finite number of exceptions for finite simple group T , every connected symmetric Cayley graph of T of valency r is normal. Employing maximal factorizations of finite almost simple groups, we work out a possible list of those exceptions for T .