

On partial parallel classes in partial Steiner triple systems

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For an integer ρ such that $1 \leq \rho \leq v/3$, define $\beta(\rho, v)$ to be the maximum number of blocks in any partial Steiner triple system on v points in which the maximum partial parallel class has size ρ . We obtain lower bounds on $\beta(\rho, v)$ by giving explicit constructions, and upper bounds on $\beta(\rho, v)$ result from counting arguments. We show that $\beta(\rho, v) \in \Theta(v)$ if ρ is a constant, and $\beta(\rho, v) \in \Theta(v^2)$ if $\rho = v/c$, where c is a constant. When ρ is a constant, our upper and lower bounds on $\beta(\rho, v)$ differ by a constant that depends on ρ . Finally, we apply our results on $\beta(\rho, v)$ to obtain infinite classes of sequenceable partial Steiner triple systems.

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