Group Divisible Designs of Three Groups and Block Size Five with Configuration $(1, 2, 2)$

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We present the group divisible designs with three groups and block size five in which each block has Configuration $(1, 2, 2)$, that is, each block has exactly one point from one of the three groups and two points from each of the other two groups. We provide necessary and sufficient conditions of the existence of a GDD $(n, 3, 5; \lambda_1, \lambda_2)$ with Configuration $(1, 2, 2)$. A highlight of this study is a technique which uses two and then three idempotent MOLS consecutively to construct a required family of GDDs.