Seelinger, G.; **Sissokho, P.**; **Spence, L.**; **Vanden Eynden, C.**
Partitions of $V(n,q)$ into 2- and s-dimensional subspaces. (English) Zbl 1267.51007
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Let $V(n,q)$ denote a vector space of dimension n over the field with q elements. A vector space partition of $V(n,q)$ is a collection $\mathcal{P}$ of subspaces of $V(n,q)$ such that each non-zero vector is contained in precisely one element of $\mathcal{P}$. A vector space partition is of type $d_1^{x_1}\cdots d_k^{x_k}$ if it contains precisely x_i subspaces of dimension d_i. Let s and n be integers with $s \geq 3$ and $n \geq 2s$. The authors show that the existence of partitions of $V(n,q)$ across a suitable range of types $s^x 2^y$ implies the existence of partitions of $V(n+j,q)$ of essentially all the types $s^x 2^y$ for any integer $j \geq 1$. They apply this result to construct partitions of $V(n,2)$ of types $5^x 2^y$ for all $n \geq 14$.

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MSC:

51E14 Finite partial geometries (general), nets, partial spreads
51E23 Spreads and packing problems in finite geometry
51E10 Steiner systems in finite geometry

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