

SOME SUBSPACES OF THE PROJECTIVE SPACE $\text{PG}(\wedge^K V)$ RELATED TO REGULAR SPREADS OF $\text{PG}(V)^*$

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Abstract. Let V be a $2m$ -dimensional vector space over a field \mathbb{F} ($m \geq 2$) and let $k \in \{1, \dots, 2m - 1\}$. Let $A_{2m-1,k}$ denote the Grassmannian of the $(k-1)$ -dimensional subspaces of $\text{PG}(V)$ and let e_{gr} denote the Grassmann embedding of $A_{2m-1,k}$ into $\text{PG}(\wedge^k V)$. Let S be a regular spread of $\text{PG}(V)$ and let X_S denote the set of all $(k-1)$ -dimensional subspaces of $\text{PG}(V)$ which contain at least one line of S . Then we show that there exists a subspace Σ of $\text{PG}(\wedge^k V)$ for which the following holds: (1) the projective dimension of Σ is equal to $\binom{2m}{k} - 2 \cdot \binom{m}{k} - 1$; (2) a $(k-1)$ -dimensional subspace α of $\text{PG}(V)$ belongs to X_S if and only if $e_{gr}(\alpha) \in \Sigma$; (3) Σ is generated by all points $e_{gr}(p)$, where p is some point of X_S .

Key words. Regular spread, Grassmannian, Grassmann embedding, Klein correspondence.

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