

1125-94-653

Wei-Hsuan Yu* (u690604@gmail.com), okemos. *New bounds for equiangular lines and spherical two-distance sets.*

A set of lines in \mathbb{R}^n is called equiangular if the angle between each pair of lines is the same. We derive new upper bounds on the cardinality of equiangular lines. Let us denote the maximum cardinality of equiangular lines in \mathbb{R}^n with the common angle $\arccos \alpha$ by $M_\alpha(n)$. We prove that $M_{\frac{1}{a}}(n) \leq \frac{1}{2}(a^2 - 2)(a^2 - 1)$ for any $n \in \mathbb{N}$ in the interval $a^2 - 2 \leq n \leq 3a^2 - 16$ and $a \geq 3$. Moreover, we discuss the relation between equiangular lines and spherical two-distance sets and we obtain the new results on the maximum spherical two-distance sets in \mathbb{R}^n up to $n \leq 417$. (Received September 08, 2016)