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Wei-Hsuan Yu* (u690604@gmail.com), **Alexander Barg** and **Takayuki Okuda**. *New upper bounds for equiangular line sets.*

The maximum size of equiangular line sets had been studied in the 1940s. We use the semidefinite programming method to extend the known results of the maximum size of equiangular line sets in \mathbb{R}^n when $24 \leq n \leq 41$ and $n=43$. This provides a partial resolution of the conjecture set forth by Lemmens and Seidel (1973). We also derive new relative bounds for the equiangular line sets and prove the non-existence of tight spherical designs of harmonic index 4 in \mathbb{R}^n for $n \geq 3$. (Received December 16, 2014)