1067-42-1598 **Rui Yu*** (yur@email.sc.edu), Department of Mathematics, University of South Carolina, 1523 Greene Street, Columbia, SC 29208, **Vladimir Temlyakov** (Temlyak@math.sc.edu), Department of Mathematics, University of South Carolina, Columbia, SC 29208, and **Dmitriy Bilyk** (bilyk@math.sc.edu), Department of Mathematics, University of South Carolina, 1523 Greene Street, Columbia, SC 29208. *Fibonacci Sets are good for discrepancy and numerical integration.*

We study the Fibonacci sets from the point of view of their quality for numerical integration and discrepancy. Let $\{b_n\}_{n=0}^{\infty}$ be the sequence of Fibonacci numbers. The b_n-point Fibonacci set $\mathcal{F}_n \subset [0,1]^2$ is defined as $\mathcal{F}_n := \{(\mu/b_n, \{\mu b_{n-1}/b_n\})\}_{\mu=1}^{b_n}$, where $\{x\}$ is the fractional part of a number $x \in \mathbb{R}$. It is known that cubature formulas based on Fibonacci sets $\mathcal{F}_n$ give optimal in the sense of order rate of error of numerical integration for classes of functions with mixed smoothness.

We prove that the Fibonacci sets have optimal in the sense of order L_∞ discrepancy. We establish that the symmetrized Fibonacci set $\mathcal{F}'_n := \{(p_1,p_2) \cup (p_1, 1-p_2) : (p_1,p_2) \in \mathcal{F}_n\}$ has minimal in the sense of order L_2 discrepancy and provide an exact formula for this quantity. We also introduce centered L_p discrepancy which is a modification of the L_p discrepancy to make it symmetric with respect to the center of the unit square. We prove that the Fibonacci set $\mathcal{F}'_n$ has minimal in the sense of order centered L_p discrepancy for all $p \in (1,\infty)$. We apply the Fourier method to prove the results. (Received September 21, 2010)