1073-05-171 **Zoltan Furedi** (z-furedi@math.uiuc.edu), **Tao Jiang*** (jiangt@muohio.edu) and **Robert Seiver** (seiverrs@muohio.edu). *Hypergraph Turan numbers of uniform linear paths.*

Given a k-uniform hypergraph (or a k-graph for short) H and a positive integer n, the Turán number $ex_k(n, H)$ of H is the maximum number of edges in a k-graph $\mathcal{F}$ on n vertices that does not contain H as a subhypergraph. The Turán problem for hypergraphs is difficult and $ex_k(n, H)$ is asymptotically determined only for very few graphs. Exact values are known only for a handful of k-graphs H, most of which are on a small number of vertices.

A k-uniform linear path $\mathcal{P}_\ell^k$ of length ℓ is a k-graph with hyperedges $F_1, \ldots, F_\ell$ such that $|F_i \cap F_{i+1}| = 1$ for all i and $F_i \cap F_j = \emptyset$ whenever $|i - j| > 1$. Frankl determined $ex_k(n, \mathcal{P}_\ell^k)$ when $\ell = 2$. Here, we determine $ex_k(n, \mathcal{P}_\ell^k)$ exactly for all fixed $\ell \geq 1, k \geq 4$, and sufficiently large n. We show that $ex_k(n, \mathcal{P}_{2t+1}^k) = \binom{n-1}{k-1} + \binom{n-2}{k-1} + \ldots + \binom{n-t}{k-1}$ and $ex(n, \mathcal{P}_{2t+2}^k) = \binom{n-1}{k-1} + \binom{n-2}{k-1} + \ldots + \binom{n-t}{k-1} + \binom{n-t-2}{k-2}$. We also describe the unique extremal graphs and establish stability results on these bounds. Our main method is the delta-system method. (Received August 02, 2011)