1124-05-49 **Eva Czabarka**, **Laszlo A. Szekely*** (szekely@math.sc.edu) and **Stephan Wagner**. *Subtrees of trees.*

There is continuing interest in the distribution of small subgraphs of graphs by isomorphism type. For trees, to avoid a trivial answer, one has to investigate the distribution of subtrees of a given small size. We proved the following conjecture of Bubeck and Linial: if in a sequence of trees, where the tree size goes to infinity, the proportion of k-vertex paths among k-vertex subtrees becomes negligible, then almost all k-vertex subtrees are stars. We also showed that the maximum number of non-isomorphic subtrees (of all sizes) of trees on n vertices is $\Theta(5^{n/4})$.

Another way of looking for subtrees is the following: in a rooted binary tree, any k leaves induce a rooted subtree. To obtain the induced rooted binary subtree of this leaf set, suppress non-root vertices of degree 2. Now the natural question is the distribution of the k-leaf induced rooted binary subtrees. Results on this problem led to a proof that a randomly and uniformly selected n-leaf tanglegram has tanglegram crossing number $\Theta(n^2)$ with near 1 probability. (Received August 18, 2016)