1135-15-1117 **Shuliang Bai*** (sbai@math.sc.edu) and **Linyuan Lu**. *On the spectral radius of hypergraph with e edges and $\{0,1\}$-tensor with e ones.* Preliminary report.

Let $r \geq 2$, let $f_r\colon [0,\infty) \to [1,\infty)$ be the unique analytic function such that $f_r(\binom{k}{r}) = \binom{k-1}{r-1}$ for any $k \geq r-1$. We prove that the spectral radius of an r-uniform hypergraph H with e edges is at most $f_r(e)$. The equality holds if and only if $e = \binom{k}{r}$ for some positive integer k and H is the union of a complete r-uniform hypergraph K_k^r and some possible isolated vertices. This result generalizes the classical Stanley's theorem on graphs. We extend the problem to general $\{0,1\}$-tensors and prove that the spectral radius of an r-th order $\{0,1\}$-tensor A with e ones is at most $e^{\frac{r-1}{r}}$ with the equality holds if and only if $e = k^r$ for some integer k and all ones lies in a principle sub-tensor $\mathbf{1}_{k\times\cdots\times k}$. We also prove a stabilistic result for general A with e ones where $e = k^r + l$ with relatively small l. Using the stabilistic result, we completely characterize the maximum tensors among all r-th order $\{0,1\}$-tensor A with $k^r + l$ ones, with $-r-1 \leq l \leq r$, for sufficiently large k. (Received September 19, 2017)