1117-60-189 **Alexander E. Litvak**, **Anna Lytova*** (anna.lytova@gmail.com), **Konstantin Tikhomirov**, **Nicole Tomczak-Jaegermann** and **Pierre Youssef**. *On invertibility of adjacency matrices of random d-regular directed graphs.*

We consider the set $\mathcal{D}_{n,d}$ of all d-regular directed graphs on n vertices. Let G be a graph chosen uniformly at random from $\mathcal{D}_{n,d}$ and M_n be its adjacency matrix. We show that M_n is invertible with probability at least $1 - C\ln^3 d/\sqrt{d}$ for $C \leq d \leq cn/\ln^2 n$, where c, C are positive absolute constants. To this end, we establish a few properties of d-regular directed graphs. One of them, a Littlewood–Offord type anti-concentration property, is of independent interest. Let J be a subset of vertices of G with $|J| \approx n/d$. Let δ_i be the indicator of the event that the vertex i is connected to J and define $\delta = (\delta_1, \delta_2, ..., \delta_n) \in \{0,1\}^n$. Then for every $v \in \{0,1\}^n$ the probability that $\delta = v$ is exponentially small. This property holds even if a part of the graph is "frozen." (Received January 13, 2016)