1031-05-121 **Jean Bourgain**, **Van H Vu** and **Philip Matchett Wood*** (matchett@math.rutgers.edu), Department of Mathematics, Hill Center-Busch, Rutgers, The State University of New Jersey, 110 Frelinghuysen Rd, Piscataway, NJ 08854. *On the singularity probability of discretely random complex matrices.*

Let n be a large integer and M_n be a random matrix whose entries are independent random variables taking values in the complex numbers. For constants $0 < q \le p < 1$ and a constant integer r, we will define a property (p, q)*-bounded of exponent* r and prove that if the entries of M_n satisfy this property, then the probability that M_n is singular is at most $\left(p^{1/r} + o(1)\right)^n$. Our work generalizes that of Kahn, Komlós, and Szemerédi and that of Tao and Vu. In the special case where the entries of M_n take the values $+1, -1$ each with probability $1/2$, our result proves that the probability that M_n is singular is at most $\left(\frac{1}{\sqrt{2}} + o(1)\right)^n$, improving on the previous best known upper bound of $\left(\frac{3}{4} + o(1)\right)^n$ proved by Tao and Vu. We present a few other corollaries of our main result, including proving that the $\left(\frac{1}{\sqrt{2}} + o(1)\right)^n$ bound holds for any random complex matrix M_n so long as the distribution of each entry is symmetric and a simple uniformity condition is satisfied. We also show that our main result can be extended to the case where M_n has $\mathfrak{f} \le O(\ln n)$ rows containing fixed, non-random entries. (Received August 06, 2007)