1161-05-252 **Michael Anastos*** (manastos@zedat.fu-berlin.de). *On a k-matching algorithm and finding k-factors in random graphs with minimum degree $k+1$ in linear time.*

We show that for $k+1 \geq 3$ and $c > (k+1)/2$ w.h.p. the random graph on n vertices, cn edges and minimum degree $k+1$ contains a (near) perfect k-matching. As an immediate consequence we get that w.h.p. the $(k+1)$-core of $G_{n,p}$, if non empty, contains a (near) spanning k-regular subgraph. This improves upon a result of Chan and Molloy and completely resolves a conjecture of Bollobás, Kim and Verstraëte. In addition, we show that such a subgraph can be found in a linear time w.h.p. A substantial element of the proof is the analysis of a randomized algorithm for finding k-matchings in random graphs with minimum degree $k+1$. (Received August 18, 2020)