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# On a Greedy 2-Matching Algorithm and Hamilton Cycles in Random Graphs with Minimum Degree at Least Three

## Alan Frieze

*(Submitted on 25 Jul 2011 (v1), last revised 8 Aug 2011 (this version, v3))*

We describe and analyse a simple greedy algorithm \2G\ that finds a good 2-matching $M$ in the random graph $G=G_{n,cn}^{\d\geq 3}$ when $c\geq 15$. A 2-matching is a spanning subgraph of maximum degree two and $G$ is drawn uniformly from graphs with vertex set $[n]$, $cn$ edges and minimum degree at least three. By good we mean that $M$ has $O(\log n)$ components. We then use this 2-matching to build a Hamilton cycle in $O(n^{1.5+o(1)})$ time \whp.

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|---|---|
| Comments: | Companion paper to "On a sparse random graph with minimum degree {three}: Likely Posa's sets are large" |
| Subjects: | **Combinatorics (math.CO)** |
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| | (or **arXiv:1107.4947v3 [math.CO]** for this version) |

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