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Scaling properties of critical random Boolean networks BARBARA DROSSEL, Institute of Condensed Matter Physics, TU Darmstadt — Until a few years ago, it was believed that random Boolean networks at the critical point (i.e., Kauffman networks) have a square-root relationship between the mean number of length of attractors and the system size N (i.e. the number of nodes). In the meantime, it became known that in fact the mean number and the mean length of attractors increase faster than any power law with increasing N. This talk gives an intuitive understanding of why this is the case. We investigate mainly analytically the scaling behavior of the number of nodes that are not frozen on all attractors, and of the number of relevant nodes, i.e. the nodes that determine the number and length of attractors. From the results it becomes clear that the relevant nodes form of the order of log(N) components, most of which have the form of simple loops. From this in turn attractor numbers and lengths follow by simple combinatorics. References: V. Kaufman, T. Mihalev, B. Drossel, PRE 72, 046124 (2005). B. Drossel, T. Mihalev, F. Greil, PRL94, 088701 (2005). B. Drossel, PRE72, 016110 (2005).

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