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RNA secondary structure critical exponents of random sequences near the glass transition[1] WILLIAM BAEZ, RALF BUNDSCHUH, The Ohio State University — RNA forms elaborate secondary structures through intramolecular base pairing. These structures are important for the RNA's biological function but, due to the availability of a polynomial algorithm to calculate the partition function, they are also a model system for the study of statistical physics of disordered systems. In this context, it is known that below the denaturation temperature random RNA secondary structures can exist in one of two phases: a strongly disordered, low-temperature glass phase and a weakly disordered, high-temperature molten phase. The probability of two bases pairing in these phases have been shown to scale with the distance between the two bases as -3/2 and -1.33 in the molten and glass phases, respectively. In this study, we attempt to answer the question as to the value and behavior of this scaling exponent at and around the transition temperature. We present a precise determination of the location of the critical point and then use several methods to measure the exponent at this critical point including a comparison of different analytical models to describe finite-size effects developed within both phases.

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William Baez
The Ohio State University

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