On a giant component in the intersection graph of a random chord diagram.

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Abstract

The intersection graph of a chord diagram $\mathcal{C}$ is obtained by creating a vertex for each chord in $\mathcal{C}$ and joining two vertices by an edge if the corresponding chords intersect in the diagram. We consider the directed graph obtained from this intersection graph by orienting each edge in one of the two ways each with probability 1/2. We show that whp, the intersection graph of a randomly chosen chord diagram of size n, with edge-orientations chosen uar, has a giant component of size close to n as $n \to \infty$. Moreover, we show that whp, aside from the giant component there are only isolated vertices, and the number of isolated vertices is asymptotically Poisson distributed with parameter 3 as $n \to \infty$.