

Let's talk about multiple crossings

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Let $k > 1$ be a fixed integer. It is conjectured that any graph on n vertices that can be drawn in the plane without k pairwise crossing edges has $O(n)$ edges. Two edges of a hypergraph cross each other if neither of them contains the other, they have a nonempty intersection, and their union is not the whole vertex set. It is conjectured that any hypergraph on n vertices that contains no k pairwise crossing edges has at most $O(n)$ edges. We discuss the relationship between the above conjectures and explain some partial answers, including a recent result of Kupavskii, Tomon, and the speaker, improving a 40 years old bound of Lomonosov.