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Yelena Mandelshtam* (yelena13@stanford.edu). *On graphs representable by pattern-avoiding words.*

In this paper we study graphs defined by pattern-avoiding words. Word-representable graphs have been studied extensively following their introduction in 2000 and are the subject of a book published by Kitaev in 2015. Recently there has been interest in studying graphs represented by pattern-avoiding words. In particular, in 2016, Gao, Kitaev, and Zhang investigated 132-representable graphs, that is, word-representable graphs that can be represented by a word which avoids the pattern 132. They proved that all 132-representable graphs are circle graphs and provided examples and properties of 132-representable graphs. They posed several questions, some of which we answer in this paper.

One of our main results is that not all circle graphs are 132-representable, thus proving that 132-representable graphs are a proper subset of circle graphs, a question that was left open in the paper by Gao et al. We show that 123-representable graphs are also a proper subset of circle graphs, and are different from 132-representable graphs. We also study graphs represented by pattern-avoiding 2-uniform words, that is, words in which every letter appears exactly twice. (Received September 19, 2016)