

# Branch Width and well-quasi-ordering in Matroids and Graphs

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(joint work with Jim Geelen and Bert Gerards)

As the culmination of a long series of papers Robertson and Seymour prove the following fundamental theorem: "In any infinite set of graphs there is one that is a minor of another". In other words they prove that graphs are well-quasi-ordered. An important step in the proof is to show that graphs with bounded tree width are well-quasi-ordered.

In this talk we consider an extension of this result to matroids representable over finite fields. While tree width does not extend to matroids, the related notion "branch width" does. We prove that the matroids representable over a fixed finite field with bounded branch width are well-quasi-ordered. We also give a short direct proof that the graphs with bounded branch width are well-quasi-ordered. Because of the strong relationship between branch width and tree width, this gives a straightforward proof of Robertson and Seymour's result for graphs of bounded tree width.