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The Flow and Tension Spaces of Signed Graphs

Abstract for the Combinatorics and Algebra Seminars 2007 October 23, 30, November 6

I will introduce the circuit and bond spaces for signed graphs. The key ingredient is to define the circuit and bond characteristic vectors, so that the dimensions of the spaces they span agree with the ranks of the associated signed-graph matroids.

The main result of the first talk will be a characterization of minimal directed cuts.

The main results of the second talk will be a proof of the characterization of minimal directed cuts.

The third talk will prove that the circuit and bond spaces are orthogonal complements and introduce the tension and flow spaces of signed graphs. A main result will be that the flow space and circuit space are equal. A corollary to this is that the bond and tension spaces are also equal.

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