Danish Graph Theory Meeting, 2011

Title: Decomposition theorems for classes of graphs defined by constraints on connectivity

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A graph is *minimally 2-connected* if it is 2-connected and if the removal of any edge yields a graph that is not 2-connected. A graph is *critically 2-connected* if it is 2-connected and if the removal of any vertex yield a graph that is not 2-connected. Minimally and critically 2-connected graphs were studied in the 1960s, see for instance [1] and [2]. The goal of this talk is to present decomposition theorems related to these classes. Each of these theorems will have the following form: any graph in some class is either *basic* (i.e. has a very simple structure) or is *decomposable*, (i.e. can be cut into pieces in some useful way). Applications will be presented: reproving well known results, recognitions algorithms, vertex- and edge-coloring problems.

Results obtained jointly with Pierre Aboulker, Celina de Figueiredo, Benjamin Lévêque, Raphael Machado, Frédéric Maffray, Marko Radovanović and Kristina Vušković.

References

[1] R. Halin. A theorem on n-connected graphs. *Journal of Combinatorial Theory*, 7:150–154, 1969.

[2] M.D. Plummer. On minimal blocks. *Transactions of the American Mathematical Society*, 134:85–94, 1968.