Optimal p-Hardy Weights on Locally Finite Graphs

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Abstract. Recurrence and transience are classical classifications of random walks. They are equivalent to the non-validity and validity of the Hardy inequality for the energy functional associated with the Laplace operator on the graph, respectively. The latter is an abstract inequality between functionals and can be generalised further. In this talk, we discuss a generalisation to the quasi-linear setting and show a method to get optimal Hardy weights. We illustrate this method on the natural numbers and on regular trees. If the time permits, we also discuss characterisations of having a Hardy inequality. The talk is based on work in progress.

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