

# Upper gradients and Sobolev Spaces on metric spaces

David Färm

March 29, 2006

During the last 15 years people have been exploring the possibility of solving partial differential equations in general metric spaces by generalizing the concept of Sobolev spaces. One such generalization is the Newtonian space where one uses upper gradients to compensate for the lack of a derivative.

In this presentation I will talk about this generalization and describe some of the properties that are inherited from the ordinary Sobolev spaces. This was the topic of my masters thesis which also includes my own result on the capacity associated with the Newtonian space.