## $\begin{array}{c} {\rm Jingtang~Ma} \\ {\bf Abstract~Cascading~Multigrid~Methods~in~Besov~Spaces} \end{array}$

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In this paper, the general framework of cascading multigrid methods is studied. As an application, the cascading multigrid methods are applied to the heat equation with mild regularity in Besov spaces. Furthermore we analyze a cascading multigrid method for the interior penalty discontinuous Galerkin method.