

# Multigrid for HDG

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## Abstract

We discuss the difficulties arising in the design of multigrid injection operators for HDG methods. In particular, embedding through bulk functions turns out to be unstable. Then, we discuss a recent injection operator based on continuous bulk functions, which is stable, but has the drawback of a wide stencil. The analysis of this operator reveals a quasi-optimality condition which should be fulfilled by any stable injection. We show that we can use this condition to obtain stable injection operators which are local to a single coarse grid cell and thus have a minimal stencil. We close by presenting numerical evidence that the new operators are quite efficient.

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