## Hausdorff operators in $H^p$ spaces, $0<p<1$

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For the theory of Hardy spaces $H^p$, $0<p<1$, the Hausdorff operators turn out to be a very effective testing area, in dimension one and especially in several dimensions. In contrast to the study of the Hausdorff operators in $L^p$, $1\le p \le \infty$, in the Hardy space $H^1$, and other related spaces, the study of these operators in the Hardy spaces $H^p$ with $p<1$ holds a specific place and there are very few results on this topic. For the case of one dimension, after the work of Kanjin and Miyachi, more or less final results were given in our joint paper with Miyachi. The results differ from those for $L^p$, $1\le p \le \infty$, $H^1$, etc., since they involve smoothness conditions on the averaging function, which seem unusual but unavoidable. To explain them will be the main purpose of the talk. This leads to better understanding even more specific difficulties in our multidimensional joint work with Akihiko Miyachi.