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Idempotent Fourier multipliers acting contractively on H^p spaces

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I will present a joint work with Ole Fredrik Brevig and Kristian Seip. We describe the idempotent Fourier multipliers that act contractively on $H^p(\mathbb{T}^d)$. When p is not an even integer, such multipliers are just restrictions of contractive idempotent multipliers on $L^p(\mathbb{T}^d)$ spaces, which in turn can be described by suitably combining results of Rudin and Andô. When $p = 2(n+1)$, contractivity depends in an interesting geometric way on n , d , and the dimension of the set of frequencies associated with the multiplier. Our results allow us to construct a linear operator that is densely defined on $H^p(\mathbb{T}^\infty)$ for every $1 \leq p \leq \infty$ and that extends to a bounded operator if and only if $p = 2, 4, \dots, 2(n+1)$.