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Approximate moment conditions for h^p atoms and molecules, and the boundedness of inhomogeneous Calderón–Zygmund operators

In joint work with Chun Ho Lau (Concordia), Tiago Picon (Universidade São Paulo), and Claudio Vasconcelos (Universidade Federal de São Carlos), we show that atoms and molecules for the local Hardy spaces $h^p(\mathbb{R}^n)$, $0 < p \leq 1$, must satisfy certain logarithmic-type moment conditions. From this one can obtain the necessity of the approximate cancellation conditions we have previously imposed in order to show the boundedness of inhomogeneous Calderón–Zygmund operators on these spaces.