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Weighted theory of compact operators

The boundedness properties of singular integral operators are of central importance in analysis. Within the last decade, optimal bounds for general Calderón-Zygmund operators acting on weighted Lebesgue spaces in terms of Muckenhoupt weight characteristics have been obtained. In addition to this theory concerning boundedness, a theory for compactness of Calderón-Zygmund operators has recently been established. The first goal of this talk is to present the extension of compact Calderón-Zygmund theory to weighted spaces using sparse domination techniques. A similar line of research concerns the weighted boundedness of the Bergman projection in terms of Bekollé-Bonami weights, and compactness in this setting can be understood within the study of Toeplitz operators. We also discuss the weighted theory of Toeplitz operators on the Bergman space.