

Tales on two commuting transformations or flows

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We will give an overview of conjectures, results, and techniques related to long-term dynamics of two commuting measure-preserving actions of \mathbb{Z} or \mathbb{R} on a probability space. All problems will be approached via the Calderón transference principle, reducing the questions on convergence of various ergodic averages to boundedness of integral operators on the Euclidean space. This scheme might be an overkill when merely establishing convergence, but it is usually very quantitative and appealing to harmonic analysts. The talk will be based on several papers coauthored with M. Christ, P. Durcik, J. Roos, K. A. Škreb, and C. Thiele.