On the convergence of multiple correlation sequences with integer part polynomial iterates

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In this talk we will discus well known and new results on multiple correlation sequences. More specifically, we will show that multiple ergodic averages with iterates given by the integer part of real valued polynomials converge in the (uniform) mean. Furthermore, we show that under certain assumptions the limit is zero. Also, by the same method, which is a transference principle that enables one to deduce results for $\mathbb{Z}$-actions from results for flows, we show that the parameters in the multidimensional Szemerédi theorem for closest integer polynomials have non-empty intersection with the set of shifted primes $\mathbb{P}-1$ (or similarly of $\mathbb{P}+1$). Using the Furstenberg Correspondence Principle, we show this result by recasting it as a polynomial multiple recurrence result in measure ergodic theory.

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