Title: A dynamical proof of the van der Corput inequality

Abstract:

For a bounded sequence in a Hilbert space,
the van der Corput inequality states that asymptotically, norms of averages can be bounded by averages of correlations.
This idea is routinely used for complexity reduction to prove different equidistribution and ergodic theorems.
On the other hand, the Furstenberg correspondence principle provides a universal technique to study the asymptotic behavior of scalar sequences in terms of measure-preserving dynamical systems. Can the van der Corput inequality and related asymptotic inequalities
thus be reduced to dynamical principles?
We will address this question in the scalar case and then discuss how to overcome the limitation of the Furstenberg correspondence principle to scalar sequences. This is joint work with Henrik Kreidler and Rainer Nagel.