Nilsequences and multiple correlations along subsequences.

Let \((X, \mu, T)\) be a measure preserving system and \(f\) a bounded function on \(X\). The sequence \(a(n) = \int f \cdot T^n f \cdot T^{kn} f d\mu\) is called a multiple correlation sequence. By the works of Bergelson, Host, Kra and Leibman, a multiple correlation sequence can be decomposed into a sum of a nilsequence (a sequence defined by evaluating a continuous function along an orbit in a nilsystem) and a nullsequence (a sequence that is zero in uniform density). In this talk, we present a refinement of that result by showing the nullsequence is null along primes, along integer polynomials and Hardy field sequence \([n^c]\). (Received January 31, 2018)