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*Sieving with large primes*

Can one sieve with primes bigger than  $x^{1/2}$  ? Certainly no current sieve methods work in this range, and there are good reasons to believe that it should be difficult to go past this "barrier". However Dimitris Koukoulopoulos, Kaisa Matomaki and I have recently succeeded in a certain special case, which leads to some guesses as to the right questions to ask in the general situation. Part of our proof emerges from additive combinatorics, a tool that has not traditionally been used in sieve theory.