E1-35: Qσ-families of sets and summability

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A Qσ-ring is a ring of sets with the property that, for any disjoint sequence (A_n) of members of the ring, there exists an infinite subset M of the positive integers such that $n\varepsilon \cup_m A_n$, is a member of the ring.

In this paper we investigate families of subsets of 2^N that satisfy this Qσ-condition. Examples are given to show that there are many such structures in 2^N that are neither σ-rings nor algebras. An example is also given of a ring in 2^N that is an FQσ-ring (the Qσ-condition is satisfied for finite sets), but is not a Qσ-ring. The main observation is that FQσ-families in 2^N are, in the summability sense, large - the Bennett-Kalton inclusion theorem technique can be used to show that a separable FK-space contains all bounded sequences if it contains the sequence of 0s and 1s associated with an FQσ-family.