Limit theorems for aggregated processes

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Consider the array of RCA-processes $\Lambda_{k,N} := \left\{ X_{k,i} \right\}_{1 \leq i \leq N}$, where $X_{k,i} = \sum_{j=0}^{\infty} \alpha_{j,i} \epsilon_{k-j,i}$ are linear processes and let $Y_{k,N} = N^{-1/2} \sum_{i=1}^{N} X_{k,i}$, $k = 1, 2, \ldots$ be the aggregated process. We establish weak and strong invariance principles for the partial sum of functionals of $\{Y_{k,N}, 1 \leq k \leq n\}$, where n, N are allowed to approach infinity simultaneously. Applications to moment estimation for aggregated RCA(1) and RCA(2)-processes are discussed.