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E-sequential envelopes

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E-SEQUENTIAL ENVELOPES

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It was proved by the first author (Czechoslovak Math. J. 26(1976), 604-612) that an E-sequentially regular convergence space (L,λ), where E is a subset of the real line R, can have at most two topologically different E-sequential envelopes $\sigma_E L$ (viz. $\sigma_{\{0,1\}}L$ and $\sigma_R L$) and a problem was put forward whether there is a $\{0,1\}$-sequentially regular convergence space L such that $\sigma_{\{0,1\}}L \neq \sigma_R L$ (cf. Problem 2.5).

1. If L is $\{0,1\}$-sequentially regular convergence space, then $\sigma_{\{0,1\}}L$ is the sequential closure of L in the Banaschewski 0-dimensional compactification $\beta_0 L$ of L.

2. There is a maximal almost disjoint family $\mathcal{F}$ on ω such that, for the usual space $L = \omega \cup \mathcal{F}$, $\beta_0 L$ is a sequential space (of order 2), card $(\beta_0 L - L) = 1$, card $(\beta L - L) \geq 2^{\omega}$. Thus $\sigma_{\{0,1\}}L \neq \sigma_R L$ (since L is not countably compact) and Ind $L > 0$.

3. We can characterize (in terms of fundamental multisequences) the $\{0,1\}$-sequentially regular space L for which $\sigma_{\{0,1\}}L = \sigma_R L$. Since $\sigma_R L = \sigma_{[0,1]}L$, the characterization is similar to that of spaces X with Ind X = 0 (i.e., for which $\beta X = \beta_0 X$).

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