On Borel structures in function spaces

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The talk is based on the joint works with Roman Pol and Grzegorz Plebanek

Session: 36. Topology in Functional Analysis

Given a space $C(K)$ of continuous real-valued functions on a compact space K, we shall consider the three σ-algebras of Borel sets in $C(K)$ generated by the uniform topology, the weak topology, and the pointwise topology in $C(K)$. We will discuss some problems concerning these σ-algebras in $C(K)$.

M. Talagrand showed that, for the Čech-Stone compactification $\beta\omega$ of the space of natural numbers ω, the norm and the weak topology generate different Borel structures in $C(\beta\omega)$. We prove that the Borel structures in $C(\beta\omega)$ generated by the weak and the pointwise topology are also different.