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Nice topologies of Polish G-spaces and admissible sets

Let G be a closed subgroup of the group S_∞ of all permutations of ω. Let $(\langle X, \tau \rangle, G)$ be a Polish G-space. H.Becker has defined *nice topologies* of X by the property that they are finer than τ, the G-action remains continuous and there is a countable basis (*nice basis*) consisting of clopen sets which are invariant with respect to some open subgroups of G and satisfy some further natural conditions (see H.Becker, Topics in invariant descriptive set theory, Ann.Pure Appl.Logic, 111(2001), 145 - 184).

For every $x \in X$ we construct an admissible set $\mathbb{A}_x$ and study nice bases which can be coded in $\mathbb{A}_x$ in some canonical way. Analysing definability in $\mathbb{A}_x$ of codes of some natural families of Borel sets and relations between them we can consider complexity of these objects. Moreover it turns out that the condition that x is generic with respect to the nice topology can be expressed in the language of $\mathbb{A}_x$.