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Zappa-Szép Actions of Groups on Product Systems

Let G be a group and X be a product system over a semigroup P. Suppose G has a left action on P and P has a right action on G, so that one can form a Zappa-Szép product $P \bowtie G$. We define a *Zappa-Szép action* of G on X, roughly speaking, to be a collection of functions on X, which is compatible with both actions from $P \bowtie G$. For a given Zappa-Szép action of G on X, we construct a new product system $X \bowtie G$ over $P \bowtie G$, which is called the Zappa-Szép product of X by G. Then we associate $X \bowtie G$ some universal C*-algebras, and show some Hao-Ng type isomorphisms. A special case of interest is when the action is homogenous.

This is ongoing joint work with Boyu Li.