Weak commutativity and nonabelian tensors revisited

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Abstract.

In 1980 Sidki introduced his weak commutativity construction $\mathcal{X}(G) = \{G, G^\psi \,|\, [x, x^\psi] \text{ all } x \in G\}$ defined for any group G and isomorphism $\psi\colon G \to G^\psi$. In 1984 Brown and Loday introduced their nonabelian tensor square $G \otimes G$ generated by symbols $x \otimes y$ with $x, y \in G$ subject to relations $xx' \otimes y = (x^{x'} \otimes y^{x'})\,(x' \otimes y)$ and $x \otimes yy' = (x \otimes y')\,(x^{y'} \otimes y^{y'})$. Both constructions are known to inherit properties from G such as π-finite (π a set of primes), perfect, soluble, finite nilpotent , ... Both constructions are related to the Schur multiplier of G. In this talk I'll begin with a review of weak commutativity and nonabelian tensor products. I'll then introduce a variant $\widetilde{\mathcal{X}}(G)$ of Sidki's weak commutativity group $\mathcal{X}(G)$ and a variant $G \otimes_r G$ of the non-abelian tensor square $G \otimes G$ ($r \geq 2$) of a group G. These variants are modelled on universal commutator relations, inherit various properties from G, and admit homomorphic surjections $\widetilde{\mathcal{X}}(G) \twoheadrightarrow \mathcal{X}(G)$, $G \otimes_r G \twoheadrightarrow G \otimes G$ ($r \geq 2$). This is joint work with Dessislava Kochloukova.

References

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