

Twisted partial actions of groups on semilattices of groups

MIKHAILO DOKUCHAEV*, MYKOLA KHRYPCHENKO**

Instituto de Matemática e Estatística

Universidade de São Paulo, São Paulo, Brazil

Email: dokucha@gmail.com, nskhrichenko@gmail.com

ABSTRACT. It was proved in [2] that any inverse partial module over a group can be identified with a module (in the sense of Lausch [4] over an inverse monoid S via an admissible partial homomorphism $[3] \Gamma : G \rightarrow S$. We extend this result to certain twisted partial actions [1] of groups on semilattices of groups, involving a concept from [4], which we call a twisted module over an inverse semigroup. More precisely, we show that the equivalence classes of such twisted partial actions of a group G on a semilattice of groups A are in a one-to-one correspondence with the equivalence classes of pairs consisting of an admissible partial homomorphism $\Gamma : G \rightarrow S$ and a twisted S -module structure on A . We use this correspondence to characterize the crossed products [1] by the twisted partial actions of groups on semilattices of groups as extensions [4] of semilattices of groups by certain inverse monoids.

KEYWORDS. Twisted partial action, semilattice of groups, crossed product, partial representation, extension, inverse semigroup

REFERENCES.

- [1] M. Dokuchaev, R. Exel, J. J. Simón, Crossed products by twisted partial actions and graded algebras, *Journal of Algebra*, 320 (2008), no. 8, 3278–3310.
- [2] M. Dokuchaev, M. Khrypchenko, Partial cohomology of groups, Preprint.
<http://arxiv.org/abs/1309.7069>
- [3] R. Exel, Partial actions of groups and actions of inverse semigroups, *Proc. Amer. Math. Soc.*, 126 (1998), 3481–3494.
- [4] H. Lausch, Cohomology of inverse semigroups, *J. Algebra*, 35 (1975), 273–303.