Galati, John C.; **LeBel, Alain C.**
Relative difference sets in semidirect products with an amalgamated subgroup. (English)
Zbl 1067.05013
J. Comb. Des. 13, No. 3, 211-221 (2005).

In recent years there has been growing interest in the construction of non-abelian examples of semiregular relative difference sets. The authors give a new construction method by using what they call semidirect product with amalgamated subgroups, that is, a group G with subgroups G_1 and G_2 such that $G = G_1 G_2$ and both $N = G_1 \cap G_2$ and G_1 are normal in G. Given relative difference sets with parameters $(m_l, n, m_l, \frac{m_l}{n})$ in two groups G_l $(l = 1, 2)$, relative to normal subgroups N_l of G_l, the authors give a sufficient condition (the existence of a compatible coupling) for the existence of a relative difference set with parameters $(m_1^i m_2^j, n, m_1^i m_2^j, \frac{m_1^i m_2^j}{n})$ in some semidirect product with amalgamated subgroup $N \cong N_1 \cong N_2$ for all positive integers i and j. They also discuss several examples for this construction.

Reviewer: Dieter Jungnickel (Augsburg)

MSC:

05B10   Combinatorial aspects of difference sets (number-theoretic, group-theoretic, etc.)

Cited in **1** Review
Cited in **2** Documents

Full Text: DOI

References:

[1]   Presentations of Groups, 2nd edition, London Mathematical Society Student Texts, Vol. 15, Cambridge University Press, Cambridge, 1997.

[2]   Galati, J Combin Designs 11 pp 307– (2003)

[3]   Jungnickel, Canad J Math 34 pp 257– (1982) · Zbl 0465.05011 · doi:10.4153/CJM-1982-018-x

[4]   and Relative difference sets fixed by inversion (III)?cocycle theoretical approach, Discrete Math, to appear. · Zbl 1159.05009

[5]   Perera, Australas J Combin 22 pp 141– (2000)

[6]   Finite geometry and character theory, Springer-Verlag, Berlin, 1995. · Zbl 0818.05001 · doi:10.1007/BFb0094449