

# A problem in multivariate analysis

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## Abstract

In the computer science the following "hidden subgroup problem" is nowadays intensively studied (see, e.g., [1], [2]): Let  $G$  be a finite group,  $f : G \rightarrow R$  be a function and assume that there exists a nontrivial subgroup  $H \subset G$  such that the  $f$  is periodic w.r.t. the  $H$ . Determine the  $H$ . This suggests the following question: What about a similar problem with  $R^n$  and  $L$  instead of  $G$  and  $H$ , resp., where  $L$  is a discrete subgroup in  $R^n$ ? The talk is about first steps in studying the latter question, based on new notions and results proved (in [3], [4], [5]) for periodic properties of functions  $f : R^n \rightarrow R$  w.r.t.  $L \subset R^n$ .

## References:

- [1] Friedl, K., F. Magniez, M. Santha, and P. Sen (2003). Quantum Testers for Hidden Group Properties. In: B. Rovan and P. Vojtas (Eds.), *Math. Foundations of Comput. Sci. 2003, Lect. Notes Comp. Sci.* (pp. 419-428). Springer.
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- [3] Uhrin, B. (1996). Inner Aperiodicities and Partitions of Sets. *Linear Algebra Appl. 241-243*, 851-876.
- [4] Uhrin, B. (2000). Periodic properties of functions and coloured sets. *Publ. Math. (Debrecen) 56*, 657-676.
- [5] Uhrin, B. (2001). The inner periodic structure of a function. *Math. Pannonica 12*, 3-25.