1104-05-136 **Iskander Aliev*** (alievi@cf.ac.uk), School of Mathematics, Cardiff University, Cardiff, CF24 4AG, United Kingdom. *Lattice programming gaps, circulant graphs and Frobenius numbers.*

Given a full-dimensional lattice $\Lambda \subset \mathbb{Z}^k$ and a cost vector $l \in \mathbb{Q}^k_{>0}$, we are concerned with the family of the group problems

$$\min\{l \cdot x : x \equiv r \bmod \Lambda, x \geq 0\}, \quad r \in \mathbb{Z}^k.$$

The *lattice programming gap* $\mathrm{gap}(\Lambda, l)$ is the largest value of the minima above as r varies over $\mathbb{Z}^k$. We show that computing the lattice programming gap is NP-hard when k is a part of input. We also obtain lower and upper bounds for $\mathrm{gap}(\Lambda, l)$ in terms of l and the determinant of Λ. The proofs are build on a relation between the group problems, circulant graphs and Frobenius numbers. (Received August 28, 2014)