

CHARACTER EXPANSIVENESS IN FINITE GROUPS

FRANCISKA PETÉNYI

ABSTRACT. Halasi, Maróti, Sidki and Bezerra in [1] studied *conjugacy expansive* and *normal conjugacy expansive* groups.

In a similar way one can define *character expansive* groups. A finite group G is *character expansive* if for any complex character α and irreducible character χ the number of irreducible constituents of the product $\alpha\chi$ (counting without multiplicity) is at least the number of irreducible constituents of α (again counting without multiplicity). For example, abelian groups are character expansive.

We examined whether a character expansive group can always be written as a direct product of simple or abelian groups. We note that the other direction of this problem is false, since not every simple group is character expansive. Unfortunately until now we were unable to solve the above problem completely.

Instead of character expansiveness we can consider a weaker notion. We say that G is *normal character expansive* if for any normal subgroup N and any irreducible character χ of G we have $n(1_N^G) \leq n(1_N^G \cdot \chi)$. Character expansiveness clearly implies normal character expansiveness.

We conjecture that a group is normal character expansive if and only if it is a direct product of simple or abelian groups.

The talk is based on a joint work with Zoltán Halasi, Attila Maróti and László Héthelyi.

REFERENCES

- [1] Halasi, Z.; Maróti, A.; Sidki, S.; Bezerra, M. Conjugacy expansiveness in finite groups. To appear in *J. Group Theory*.

The research has been carried out in the framework of the project “Talent care and cultivation in the scientific workshops of BME”, supported by the grant TAMOP -4.2.2.B-10/1-2010-0009.