СЕМИНАР

„АЛГЕБРА И ЛОГИКА”

Драги колеги,
Следващото заседание на семинара ще се проведе
на 30 ноември 2018 г. (петък) от 13:00 часа
в зала 578 на ИМИ – БАН.
Доклад на тема

Decomposing normalized units in commutative modular group rings

ще изнесе Петър Данчев.

Покανват се всички желаещи.

От секция „Алгебра и логика” на ИМИ – БАН

http://www.math.bas.gg/algebra/seminarAiL/

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Abstract

Introduction: Suppose G is an abelian p-group and F is a perfect field of characteristic $p > 0$. As usual, FG denotes the group algebra of G over F with group of normalized units $V(FG)$ and augmentation ideal $I(FG;G)$. For any ideal I of FG, we set I^n as the product of I written n times, where n is an arbitrary fixed natural number. The numerous decompositions of the normed group $V(FG)$, in which the former group G can be viewed as a decomposing component, are currently of some interest and significance in the theory of commutative modular group algebras.

Actuality: This subject is closely related to the so-called Direct Factor Problem (DFP) and the statements obtained below shed some more light in that way. Specifically, the DFP asked of whether or not the group G is always a direct factor of $V(FG)$ with totally projective complement.

Results: We prove the following two, somewhat curious theorems:

T1. *Let F be a perfect field of characteristic p and let G be an abelian p-group. Then the equality $V(FG) = G(1+I^2(FG;G))$ holds if, and only if, G is divisible, that is, $G = G^p$, or G is not divisible and F is the p-element field Z_p.*
In particular, the equality $V(Z_pG) = G(1+I^2(Z_pG;G))$ is always fulfilled, provided G is an abelian p-group.

T2. *Let F be a perfect field of characteristic $p > 2$ and let G be an abelian p-group. Then the equality $V(FG) = G(1+I^p(FG;G))$ holds if, and only if, G is divisible, i.e., $G = G^p$.*

Methods: We use technique which exploits certain decompositions of units in modular group rings as well as some special homomorphisms between linear spaces.

An open problem: Find a criterion only in terms of F and G for the validity of the equality $V(FG) = G(1+I^n(FG;G))$, where n is an arbitrary but fixed natural.

Publishing status: These results are an important part of a subsequent own publication of Peter V. Danchev under the same title as above in the journal/periodical of the Romanian Academy of Sciences "*Rev. Rouman. Math. Pures & Appl.*", vol. **64**, No 1, 2019.