

Class Character Rings of groups J_1 and $O'N$

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The class character rings of group has been introduced and studied in [1].

The investigation of class character rings is the important step to the description of central units of group.

The quite exact information about class character rings has been obtained for all sporadic groups in [2]. Also there are the descriptions of unit groups of class character rings of all sporadic groups, if the class character ring is contained in some quadratic field.

Let ζ_{19} be a primitive 19th root of unity and

$$\begin{aligned} C &= \zeta_{19} + \zeta_{19}^7 + \zeta_{19}^8 + \zeta_{19}^{11} + \zeta_{19}^{12} + \zeta_{19}^{18}, \\ D &= \zeta_{19}^4 + \zeta_{19}^6 + \zeta_{19}^9 + \zeta_{19}^{10} + \zeta_{19}^{13} + \zeta_{19}^{15}. \end{aligned}$$

By [2] the groups Janko J_1 und O'Nan $O'N$ have the following class character rings

$$K_1 = \mathbf{Z} + 77\mathbf{Z}C + 77\mathbf{Z}D \quad \text{and} \quad K_2 = \mathbf{Z} + 116963\mathbf{Z}C + 116963\mathbf{Z}D,$$

respectively.

Theorem. *The unit groups of K_1 and K_2 are*

$$\begin{aligned} &\langle -1 \rangle \times \langle (2 + C)^{30} \rangle \times \langle (2 + D)^{30} \rangle, \\ &\langle -1 \rangle \times \langle (2 + C)^{1470} \rangle \times \langle (2 + D)^{1470} \rangle, \end{aligned}$$

respectively.

References

- [1] Aleev, R. Zh. Central Elements of Integral Group Rings. *Algebra and Logic* **11** (2000) 293–300.
- [2] Molodorich, M. I., The class character rings of sporadic groups. *SEMR* **11** (2014) 878–886.