DIVISION ALGEBRAS OF PRIME DEGREE WITH INFINITE GENUS

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The genus \( \text{gen}(D) \) of a finite-dimensional central division algebra \( D \) over a field \( F \) is defined as the collection of classes \([D'] \in Br(F)\), where \( D' \) is a central division \( F \)-algebra having the same maximal subfields as \( D \). In [1], it is shown that there are quaternion algebras with infinite genus. Besides, it is proved that there exists a field \( F \) over which there are infinitely many nonisomorphic quaternion algebras with center \( F \), and any two quaternion division algebras with center \( F \) have the same genus. In [2], we generalize the results from [1] to the case of division algebras of any prime degree. More precisely, for any prime \( p \), we construct a division algebra of degree \( p \) with infinite genus. Moreover, we show that there exists a field \( K \) such that there are infinitely many nonisomorphic central division \( K \)-algebras of degree \( p \), and any two such algebras have the same genus.

References

1. Meyer J.S. Division algebras with infinite genus // Bull. London Math. Soc. 2014. V. 46. No. 3. P. 463–468.
2. Tikhonov S.V. Division algebras of prime degree with infinite genus // Preprint \texttt{arXiv:1407.5041}.