Codes Whose Automorphism Groups are S_{11}, $PSL_2(11)$ or $PSL_2(11):2$

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We examine some designs and binary codes constructed from the primitive permutation representation of the group $PSL_2(11)$. For $PSL_2(11)$ of degree 55, we construct two designs with the automorphism group $PSL_2(11)$ and their codes invariant under the groups S_{11} and $PSL_2(11)$. Also, we construct a design and its code invariant under the group $PSL_2(11):2$. The weight distribution and the dual of these codes are determined. By considering the action of S_{11} on some code, we obtain the structure of the stabilizer for every codeword and construct some designs such that S_{11} acts primitively on them.

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