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Further Results on Binary Codes Obtained by Doubling Construction

Alexander A. Davydov[1], Stefano Marcugini[2], Fernanda Pambianco[2]

[1]*Kharkevich Institute for Information Transmission Problems*
Russian Academy of Sciences
Bolshoi Karetnyi pereulok 19, GSP-4, Moscow, 127994, Russian Federation
adav@iitp.ru

[2]*Dipartimento di Matematica e Informatica, Università degli Studi di Perugia*
Via Vanvitelli 1, Perugia, 06123, Italy
{stefano.marcugini,fernanda.pambianco}@unipg.it

Binary codes created by doubling construction, including quasi-perfect ones with distance $d = 4$, are investigated. All $[17 \cdot 2^{r-6}, 17 \cdot 2^{r-6} - r, 4]$ quasi-perfect codes are classified. Weight spectrum of the codes dual to quasi-perfect ones with $d = 4$ is obtained. The automorphism group $\mathrm{Aut}(\mathcal{C})$ of codes obtained by doubling construction is studied. A subgroup of $\mathrm{Aut}(\mathcal{C})$ is described and it is proved that the subgroup coincides with $\mathrm{Aut}(\mathcal{C})$ if the starting matrix of doubling construction has an odd number of columns. (It happens for all quasi-perfect codes with $d = 4$ except for Hamming one.) The properness and t-properness for error detection of codes obtained by doubling construction are considered.

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