MAIN MENU

WEPD – Type I $[54, 27, 10]$

This is a database of known weight enumerator parameters for singly-even binary self-dual $[54, 27, 10]$ codes.

The possible weight enumerators of a singly-even binary self-dual $[54, 27, 10]$ code are given in [5] as

$$W_{54,1} = 1 + (351 - 8\alpha)x^{10} + (5031 + 24\alpha)x^{12} + \cdots,$$
$$W_{54,2} = 1 + (351 - 8\alpha)x^{10} + (5543 + 24\alpha)x^{12} + \cdots,$$

where $\alpha \in \mathbb{Z}$.

See the links below for lists of known values of α for $W_{54,1}$ and $W_{54,2}$.

- $W_{54,1}$ known parameters (from [1–11, 13, 14])
- $W_{54,2}$ known parameters (from [1, 2, 6, 11–14])

References

[1] I. Boukliev and S. Buyuklieva. Some new extremal self-dual codes with lengths 44, 50, 54, and 58. *IEEE Trans. Inform. Theory*, 44(2):809–812, 1998. doi: 10.1109/18.661526.

[2] S. Bouyuklieva and P. R. J. Östergård. New constructions of optimal self-dual binary codes of length 54. *Des. Codes Cryptogr.*, 41(1):101–109, 2006. doi: 10.1007/s10623-006-0018-2.

[3] S. Bouyuklieva, R. Russeva, and N. Yankov. On the structure of binary self-dual codes having an automorphism of order a square of an odd prime. *IEEE Trans. Inform. Theory*, 51(10):3678–3686, 2005. doi: 10.1109/TIT.2005.855616.

[4] S. Buyuklieva and I. Boukliev. Extremal self-dual codes with an automorphism of order 2. *IEEE Trans. Inform. Theory*, 44(1):323–328, 1998. doi: 10.1109/18.651059.

[5] J. H. Conway and N. J. A. Sloane. A new upper bound on the minimal distance of self-dual codes. *IEEE Trans. Inform. Theory*, 36(6):1319–1333, 1990. doi: 10.1109/18.59931.

[6] S. T. Dougherty, T. A. Gulliver, and M. Harada. Extremal binary self-dual codes. *IEEE Trans. Inform. Theory*, 43(6):2036–2047, 1997. doi: 10.1109/18.641574.

[7] J. Gildea, A. Korban, A. M. Roberts, and A. Tylyshchak. Binary self-dual codes of various lengths with new weight enumerators from a modified bordered construction and neighbours. *Adv. Math. Commun.*, 2022. doi: 10.3934/amc.2022021.

[8] M. Harada and H. Kimura. On extremal self-dual codes. *Math. J. Okayama Univ.*, 37(1):1–14, 1995.

[9] M. Harada, T. A. Gulliver, and H. Kaneta. Classification of extremal double-circulant self-dual codes of length up to 62. *Discrete Math.*, 188(1–3):127–136, 1998. doi: 10.1016/S0012-365X(97)00250-1.

[10] P. Çomak, J.-L. Kim, and F. Özbudak. New cubic self-dual codes of length 54, 60 and 66. *Appl. Algebra Engrg. Comm. Comput.*, 29(4):303–312, 2018. doi: 10.1007/s00200-017-0343-x.

[11] V. Tonchev and V. Y. Yorgov. The existence of certain extremal $[54, 27, 10]$ self-dual codes. *IEEE Trans. Inform. Theory*, 42(5):1628–1631, 1996. doi: 10.1109/18.532913.

[12] H.-P. Tsai. Existence of some extremal self-dual codes. *IEEE Trans. Inform. Theory*, 38(6):1829–1833, 1992. doi: 10.1109/18.165461.

[13] N. Yankov and M. H. Lee. New binary self-dual codes of lengths 50–60. *Des. Codes Cryptogr.*, 73(3): 983–996, 2014. doi: 10.1007/s10623-013-9839-y.

[14] N. Yankov and R. Russeva. Binary self-dual codes of lengths 52 to 60 with an automorphism of order 7 or 13. *IEEE Trans. Inform. Theory*, 57(11):7498–7506, 2011. doi: 10.1109/TIT.2011.2155619.