

Списък на научните трудове за участие в конкурс за член-кореспондент на БАН, юни 2024

проф. дмн Петър Бойваленков

1. A. Barg, **P. Boyvalenkov**, M. Stoyanova, Bounds for the sum of distances in spherical sets of small size, *Discrete Mathematics*, 346(5), art. 113346 (19 pages), 2023 (arXiv:2105.03511v2).
2. **P. Boyvalenkov**, P. Dragnev, D. Hardin, E. Saff, M. Stoyanova, On polarization of spherical codes and designs, *Journal of Mathematical Analysis and Applications*, 524(2), art. 127065 (29 pages), 2023 (arXiv:2207.08807).
3. **P. Boyvalenkov**, P. Lyakhov, N. Semyonova, M. Valueva, G. Boyvalenkov, D. Minenkov, D. Kaplun, Residue Number Systems with six modules and efficient circuits based on power-of-two diagonal modulus, *Computers and Electrical Engineering*, 110, art. 108854 (15 pages), 2023.
4. **P. Boyvalenkov**, H. Nozaki, N. Safaei, Rationality of the inner products of spherical s -distance τ -designs for $\tau \geq 2s-2$, $s \geq 3$, *Linear Algebra and Its Applications*, 646, 107-118, 2022 (arXiv:2204.00261).
5. **P. Boyvalenkov**, K. Delchev, D. Zinoviev, V. Zinoviev, On codes with distances d and n , *Problemy Peredachi Informatsii*, 58(4), 2022, 62-83; English translation: *Problems of Information Transmission*, 58(4), 2022, 352-371.
6. **P. Boyvalenkov**, S. Boumova, M. Stoyanova, Bounds for the minimum distance and covering radius of orthogonal arrays via their distance distributions, in Proc. The 10th International Workshop on Signal Design and its Applications in Communications (IWSDA'2022), August 1-5, 2022, University of Essex, United Kingdom, IEEE Xplore, 2022, 185-189.
7. **P. Boyvalenkov**, P. Dragnev, D. Hardin, E. Saff, M. Stoyanova, Universal bounds for size and energy of codes of given minimum and maximum distances, *IEEE Transactions on Information Theory*, 67 (6, part 1 – dedicated to Vladimir I. Levenshtein), 2021, 3569-3584 (arXiv:1910.07274).
8. **P. Boyvalenkov**, M. Stoyanova, Linear programming bounds for covering radius of spherical designs, *Results in Mathematics*, 76, 2021, art. no. 95, (arXiv:2007.05599).
9. **P. Boyvalenkov**, P. Dragnev, D. Hardin, E. Saff, M. Stoyanova, Bounds for spherical codes: the Levenshtein framework lifted, *Mathematics of Computation* 90(329) 2021, 1323-1356 (arXiv:1906.03062).
10. **P. Boyvalenkov**, K. Delchev, D. Zinoviev, V. Zinoviev, On two-weight codes, *Discrete Mathematics*, 344(5), 2021, paper no. 112318, 15 pp. (arXiv:2005.13623).
11. **P. Boyvalenkov**, D. Danev, Linear programming bounds, Chapter 12 in *Concise Encyclopedia of Coding Theory* (edited by W. Cary Huffman, Jon-Lark Kim, and Patrick Solé), CRC Press/Taylor and Francis Group, 2021, 251-266 (arXiv:1903.02255).
12. **P. Boyvalenkov**, K. Delchev, M. Jourdain, Upper energy bounds for spherical designs of relatively small cardinalities, *Discrete and Computational Geometry*, 65, 2021, 244-260 (arXiv:1805.02841).
13. T. Alexandrova, **P. Boyvalenkov**, A. Sali, New lower and upper bounds for Armstrong codes, Proc. 17th International Workshop on Algebraic and Combinatorial Coding Theory, Oct. 11-17, 2020, Bulgaria, IEEE Xplore, 2021, ISBN:978-1-6654-0287-3, 1-5.
14. **P. Boyvalenkov**, K. Delchev, D. Zinoviev, V. Zinoviev, On two-weight (linear and nonlinear)

- codes, Proc. 17th International Workshop on Algebraic and Combinatorial Coding Theory, Oct. 11-17, 2020, Bulgaria, IEEE Xplore, 2021, 37-40.
15. **P. Boyvalenkov**, I. Landjev, The mathematical aspects of some problems from Coding theory, Chapter 13 in "Research in Computer Science in Bulgarian Academy of Sciences", Studies in Computational Intelligence, vol. 934, 2021, 261-285.
 16. **P. Boyvalenkov**, N. Safaei, On spherical 4-distance 7-designs, Proceedings of XVII International Symposium Problems of Redundancy in Information and Control Systems (REDUNDANCY), Moscow, Oct. 2021, 101-105.
 17. **P. Boyvalenkov**, Linear programming bounds for spherical (k, k) -designs, *Comptes rendus de l'Académie bulgare des Sciences*, 73(8), 2020, 1051-1059 (arXiv:2004.00659).
 18. **P. Boyvalenkov**, N. Chervyakov, P. Lyakhov, N. Semyonova, A. Nazarov, M. Valueva, D. Kaplun, D. Bogaevskiy, G. Boyvalenkov, Classification of moduli sets for Residue number systems with special diagonal functions, *IEEE Access*, 8, 156104-156116, 9177128, 2020.
 19. **P. Boyvalenkov**, N. Safaei, On 3-distance spherical 5-designs, *Serdica Mathematical Journal*, 46(2), 2020, 165-174 (arXiv:2007.01895).
 20. T. Alexandrova, **P. Boyvalenkov**, A. Dimitrov, Binary (k, k) -designs, *Mathematics*, 8, 2020, 1883 (arXiv: 2004.03963).
 21. **P. Boyvalenkov**, P. Dragnev, D. Hardin, E. Saff, M. Stoyanova Upper bounds for energies of spherical codes with given cardinality and separation, *Designs, Codes and Cryptography*, 88, 2020, 1811-1826 (arXiv:1909.00981).
 22. **P. Boyvalenkov**, K. Delchev, D. Zinoviev, V. Zinoviev, On q -ary codes with two distances d and $d+1$, *Problemy Peredachi Informacii* 56, No. 1, 2020, 38-50; English translation: *Problems of Information Transmission*, 56(1), 2020, 33-44 (arXiv:1906.09645).
 23. A. Levina, S. Taranov, D. Kaplun, **P. Boyvalenkov**, Wavelet codes and their implementation for protection of NAND flash memory, 2019 Photonics & Electromagnetics Research Symposium – Spring (PIERS-Spring), Rome, Italy, IEEE Xplore, 2020, 3797-3804.
 24. **P. Boyvalenkov**, P. Dragnev, D. Hardin, E. Saff, M. Stoyanova, Energy bounds for codes in polynomial metric spaces, *Analysis and Mathematical Physics* 9(2), 2019, 781-808 (arXiv:1804.07462).
 25. **P. Boyvalenkov**, P. Dragnev, D. Hardin, E. Saff, M. Stoyanova, On spherical codes with inner products in prescribed interval, *Designs, Codes and Cryptography* 87, 2019, 299-315 (arXiv:1801.07334).
 26. N. Dobrinkova, M. Panayotov, **P. Boyvalenkov**, Optimisation Techniques in Wildfire Simulations. Test Case Kresna Fire August 2017, *Lecture Notes in Computer Sciences* 11189, 2019, 72-79.
 27. **P. Boyvalenkov**, P. Dragnev, D. Hardin, E. Saff, M. Stoyanova, Linear programming bounds for energy and cardinality of codes of given min and max distances, Proc. IEEE International Symposium on Information Theory, Paris, July 2019, 1747-1751.
 28. **P. Boyvalenkov**, P. Dragnev, D. Hardin, E. Saff, M. Stoyanova, On two problems concerning universal bounds for codes, Proc. XVI International Symposium "Problems of Redundancy in Information and Control Systems 2019, 58-63.
 29. **P. Boyvalenkov**, D. Danev, M. Stoyanova, Refinements of Levenshtein bounds in q -ary Hamming spaces, *Problemy Peredachi Informacii* 54, No. 4, 2018, 35-50; English translation: *Problems of Information Transmission* 54(4), 2018, 329-342 (arXiv:1801.01982).
 30. **P. Boyvalenkov**, T. Marinova, M. Stoyanova, Nonexistence of few binary orthogonal arrays, *Discrete Applied Mathematics*, 217(P2), 2017, 144-150 (arXiv:1604.06117).
 31. **P. Boyvalenkov**, K. Delchev, On maximal antipodal spherical codes with few distances, *Electronic Notes in Discrete Mathematics* 57, 2017, 85-90.
 32. **P. Boyvalenkov**, P. Dragnev, D. Hardin, E. Saff, M. Stoyanova, Universal Lower Bounds on Energy

- and LP-Extremal Polynomials for (4,24)-Codes, *Electronic Notes in Discrete Mathematics* 57, 2017, 91-96.
33. **P. Boyvalenkov**, P. Dragnev, D. Hardin, E. Saff, M. Stoyanova, Energy bounds for codes and designs in Hamming spaces, *Designs, Codes and Cryptography* 82(1), 2017, 411-433 (arXiv:1510.03406v2).
34. **P. Boyvalenkov**, P. Dragnev, D. Hardin, E. Saff, M. Stoyanova, Universal lower bounds for potential energy of spherical codes, *Constructive Approximation* 44, 2016, 385-415 (arXiv:1503.07228).
35. **P. Boyvalenkov**, Y. Borissov, R. Tsenkov, On a Linear Cryptanalysis of a Family of Modified DES Ciphers with Even Weight S-boxes, *Cybernetics and Information Technologies* 16(4), 2016, 3-12 (eprint.iacr.org/2017/089).
36. **P. Boyvalenkov**, Y. Borissov, R. Tsenkov, Linear Cryptanalysis and Modified DES with Embedded Parity Check in the S-boxes, *Lecture Notes in Comp. Sciences* 9540, 2016, 60-78 (Proceedings, Cryptography and Information Security in the Balkans, Second International Conference BalkanCryptSec 2015, Koper, Slovenia, 3-4.09.2015).
37. **P. Boyvalenkov**, P. Dragnev, D. Hardin, E. Saff, M. Stoyanova, Universal upper and lower bounds for potential energy of spherical designs, *Dolomites Research Notes on Approximations* 8, 2015, 51-65 (arXiv:1509.07837).
38. **P. Boyvalenkov**, T. Marinova, M. Stoyanova, M. Sukalinska, Distance distributions and energy of designs in Hamming spaces, *Serdica Journal of Computing* 9(2), 2015, 139-150.
39. **P. Boyvalenkov**, H. Kulina, M. Stoyanova, T. Marinova, Nonexistence of binary orthogonal arrays via their distance distributions, *Problemy Peredachi Informacii* 51, No. 4, 2015, 23-31; English translation: *Problems of Information Transmission* 51(4), 2015, 326-334.
40. **P. Boyvalenkov**, H. Kulina, Investigation of binary orthogonal arrays via their distance distributions, *Problemy Peredachi Informacii* 49, No. 4, 2013, 28-40; English translation: *Problems of Information Transmission* 49, No. 4, 2013, 322-332.
41. **P. Boyvalenkov**, M. Stoyanova, New nonexistence results for spherical designs, *Advances in Mathematics of Communications* 7, No. 4, 2013, 279-292.
42. **P. Boyvalenkov**, S. Dodunekov, O. Musin, A survey on the kissing numbers, *Serdica Mathematical Journal* 38, 2012, 507-522 (arXiv:1507.03631).
43. **P. Boyvalenkov**, M. Stoyanova, Improved approaches for investigation of small spherical designs, *Comptes rendus de l'Académie bulgare des Sciences* 65, No. 6, 2012, 743-750.
44. **P. Boyvalenkov**, M. Stoyanova, A new asymptotic bound of the minimum possible odd cardinality of spherical $(2k - 1)$ -designs, *Discrete Mathematics* 310, 2010, No. 15-16, 2170-2175.
45. **P. Boyvalenkov**, S. Boumova, H. Kulina, M. Stoyanova, Polynomial techniques for investigation of spherical designs, *Designs, Codes and Cryptography* 51, No. 3, 2009, 275-288.
46. **P. Boyvalenkov**, S. Boumova, M. Stoyanova, A method for proving nonexistence of spherical designs of odd strength and odd cardinality, *Problemy Peredachi Informacii* 45, No. 2, 2009, 41-55; English translation: *Problems of Information Transmission* 45, No. 2, 2009, 110-123.
47. **P. Boyvalenkov**, M. Stoyanova, Spherical 2-distance sets which are spherical 3-designs, *Annual of Sofia University* 95, 2004, 53-58.
48. **P. Boyvalenkov**, S. Boumova, D. Danev, New nonexistence results for for spherical designs, in Proc. Conference on Constructive Functions Theory, B. Bojanov, Ed., 2002 Darba, Sofia, Bulgaria, 225-232.
49. **P. Boyvalenkov**, D. Danev, Uniqueness of the 120-point spherical 11-design in four dimensions, *Archiv der Mathematik* 77, 2001, 360-368.
50. **P. Boyvalenkov**, D. Danev, P. Kazakov, Indexes of spherical codes, *Codes and Association Schemes*, DIMACS Series in Discrete Mathematics and Theoretical Computer Science 56, 2001, 47-57.
51. **P. Boyvalenkov**, D. Danev, M. Mitradjieva, On bounds for codes in infinite projective spaces,

Journal of Geometry 66, 1999, 42-54.

52. **P. Boyvalenkov**, S. Boumova, D. Danev, Necessary conditions for existence of some designs in polynomial metric spaces, *European Journal of Combinatorics* 20, 1999, 213-225.

53. **P. Boyvalenkov**, D. Danev, S. Nikova, Nonexistence of certain spherical designs of odd strengths and cardinalities, *Discrete and Computational Geometry* 21, 1999, 143-156.

54. **P. Boyvalenkov**, D. Danev, I. Landgev, On maximal spherical codes II, *Journal of Combinatorial Designs* 7, 1999, 316-326.

55. **P. Boyvalenkov**, D. Danev, On linear programming bounds for codes in polynomial metric spaces, *Problemy Peredachi Informatsii* 34(2), 1998, 16-31 (in Russian); English translation in *Problems of Information Transmission* 34(2), 1998, 108-120.

56. **P. Boyvalenkov**, D. Danev, On maximal codes in polynomial metric spaces, Proc. Intern. Symposium AAECC-12, Toulouse, June 1997; Lecture Notes in Computer Science 1255, 1997, 29-38.

57. **P. Boyvalenkov**, S. Nikova, On lower bounds on the size of designs in compact symmetric spaces of rank 1, *Archiv der Mathematik* 68, 1997, 81-88.

58. **P. Boyvalenkov**, On the Besicovitch constant in small dimensions, *Comptes rendus de l'Académie bulgare des Sciences*. 50, 1997, 17-18.

59. **P. Boyvalenkov**, D. Danev, S. Bumova, Upper bounds on the minimum distance of spherical codes, *IEEE Transactions on Information Theory* 42, 1996, 1576-1581.

60. **P. Boyvalenkov**, Computing distance distributions of spherical designs, *Linear Algebra and Its Applications*, dedicated to J.J.Seidel, 226/228, 1995, 277-286.

61. **P. Boyvalenkov**, Extremal polynomials for obtaining bounds for spherical codes and designs, *Discrete and Computational Geometry* 14, 1995, 167-183.

62. **P. Boyvalenkov**, I. Landgev, On maximal spherical codes I, Proc. Intern. Symposium AAECC-11, Paris, July 1995; Springer-Verlag Lecture Notes in Computer Science 948, 1995, 158-168.

63. **P. Boyvalenkov**, On the extremality of the polynomials used for obtaining the best known upper bounds for the kissing numbers, *J. Geom.* 49, 1994, 67-71.

64. **P. Boyvalenkov**, Nonexistence of certain symmetric spherical codes, *Designs, Codes and Cryptography* 3, 1993, 69-74.