

**List of the most significant publications  
of professor Aliaksandr Hryn (Alexander Grin)**

1. Bulgakov, V., Grin, A. (1994): On a system of the third order with two integral manifolds. Mathematical research: Collection of scientific transactions, Part 2, Grodno, GrSU, 11 – 14 (in Russian).
2. Bulgakov, V., Grin, A. (1996): On a bifurcation of nonrough focus of an autonomous system of the third order. Differential Equations 12 (32), 1703.
3. Cherkas, L., Grin, A. (1997): Dulac function in the form of a second-degree polynomial for a cubic system on a plane. Differential Equations 10 (33), 1443 – 1445.
4. Cherkas, L., Grin, A. (1998): A Dulac function in a half-plane in the form of second-order polynomial for a quadratic system. Differential Equations 10 (34), 1346 – 1348.
5. Grin, A. (2000): A cubic Dulac function for a polynomial autonomous system on the plane with right-hand sides that are fourth-order nonlinearities. Differential Equations. 4 (36), 625 – 628.
6. Grin, A., Cherkas, L. (2000): Dulac function for Lienard systems. Transactions of Math. Inst. of Belorussian National Academy of Sciences 4, 29 – 38 (in Russian).
7. Cherkas, L., Grin, A. (2001): Algebraic aspects of finding a Dulac function for polynomial autonomous systems on the plane, Differential Equations, No. 3, 37, 411 – 417.
8. Cherkas, L., Grin, A. (2001): Dulac functions and D. Hilbert's 16th problem for some polynomial families of Lienard systems. Bulletin of Grodno State University, Series 2, 2(6), 7 – 17 (in Russian).
9. Grin, A., Cherkas, L. (2005): Extrema of the Andronov-Hopf function of a polynomial Lienard system. Differential Equations 1 (41), 50 – 60.
10. Grin, A. (2005): The investigation of Andronov-Hopf function of the parametrical family of Lienard polynomial systems. Bulletin of Grodno State University, Series 2, 1(31), 32 – 45 (in Russian).
11. Grin, A. Cherkas L. (2005): Spline-functions for estimation of the number of limit cycles of planar autonomous systems. Bulletin of Grodno State University, Series 2, 2(34), 50 – 60 (in Russian).
12. Cherkas, L., Grin, A. (2005): Construction of the curves of the 3-multiple limit cycles for 3-parameter families of planar autonomous systems. Scientific papers of International conference "DE&CAS'2005", Minsk, BSPU, Part 1, 218 – 223 (in Russian).
13. Cherkas, L., Grin, A. (2006): Spline-approximations in the problem of estimation of limit cycles number for planar autonomous systems. Differential Equations 2 (42), 213 – 220.
14. Grin, A. (2006): Reduction to transversality of curves in the construction of a Dulac function. Differential Equations 6 (42), 840 – 843.
15. Grin, A (2006): On the transversal curves in the Dulac – Cherkas function construction for the number of limit cycles estimation. Abstracts of International Congress of Mathematicians, Madrid, EMS, 86 – 87.
16. Grin, A. (2006): Reduction to transversality of curves and limit cycles of generalized Lienard systems. Bulletin of Grodno State University, Series 2, 2(41), 22 – 27 (in Russian).
17. Cherkas, L., Grin, A. (2006): On application of derivatives of Poincare map for estimation of the limit cycles number. Bulletin of Grodno State University, Series 2, 3(46), 3 – 10 (in Russian).
18. Cherkas, L., Grin, A., Schneider, K. (2007) On the construction of bifurcation curves related to limit cycles of multiplicity three for planar vector fields. Berlin, Preprint of WIAS No.1242.
19. Cherkas, L., Grin, A., Schneider, K. (2007): On the approximation of the limit cycles function. Electronic Journal of Qualitative Theory of Differential Equations 28, 1 – 11; <http://www.math.u-szeged.hu/ejqtde/>.

20. Grin, A., Schneider, K. (2007): On some classes of limit cycles of planar dynamical systems. Dynamics of continuous, discrete and impulsive systems, Series A: Mathematical Analysis, Volume 14, No.5, 641 – 656.
21. Cherkas, L., Grin, A. (2007): Algebraic methods of estimating the number of limit cycles for planar vector fields. Abstracts of International Conference «Analysis and singularities» dedicated to the 70th anniversary of V.I. Arnold, Moscow, 20-24 of August 2007, 105 – 107 (in Russian).
22. Cherkas, L., Grin, A. (2008): The method of auxiliary functions in the problem of estimating the number of limit cycles for planar autonomous systems. Abstracts of International Conference «Differential equations and topology» dedicated to the Centennial anniversary of L.S. Pontryagin, Moscow, 17–22 of June 2008. 207 – 208 (in Russian).
23. Grin, A. (2009): On estimation of the limit cycles number for Lienard systems. Bulletin of Grodno State University, Series 2. 1 (77), 96 – 103 (in Russian).
24. Cherkas, L., Grin, A. (2009): Dulac function in the special form for estimation of the limit cycles number for Kukles system. Bulletin of Grodno State University, Series 2, 2(82), 63 – 71 (in Russian).
25. Cherkas, L., Grin, A. (2010): Bendixon-Dulac criterion and reduction to global uniqueness in the problem of estimating the number of limit cycles. Differential Equations 46, 61 – 69.
26. Cherkas, L., Grin, A. (2010): On a Dulac function for the Kukles system. Differential Equations 46, 818 – 826.
27. Grin, A. (2010): On the estimation of the limit cycles number for Abel equation for some cases. Bulletin of Grodno State University, Series 2. 1 (92), 47 – 52 (in Russian).
28. Cherkas, L., Grin, A. (2010): On the estimation of the limit cycles number of the second type for autonomous systems on a cylinder. Abstracts of International Conference on differential equations and dynamical systems, Moscow, Suzdal, 2–7 of July 2010, 191 – 192 (in Russian).
29. Cherkas, L., Grin, A. (2010): On the construction of Dulac function in the form of a product of functions. Proceedings of 5<sup>th</sup> International conference «Analytical methods of analysis and differential equations» V. 2. – Minsk: Math. Inst. of Belorussian National Academy of Sciences, 14-19 of September, 135 – 139 (in Russian).
30. Cherkas, L., Grin, A., Schneider, K. (2011): Dulac-Cherkas functions for generalized Lienard systems. Electronic Journal of Qualitative Theory of Differential Equations, No. 35, 1 – 23; <http://www.math.u-szeged.hu/ejqtde/>.
31. Cherkas, L., Grin, A. (2011): Limit cycle function of the second kind for autonomous systems on the cylinder. Differential Equations 47, 462 – 470.
32. Grin, A. (2011): Dulac-Cherkas function and its application to estimation of limit cycles number for some classes of planar autonomous systems. Abstracts of the talks and posters of international conference “Advances in qualitative theory of differential equations” Castro Urdiales, September 12-16, 2011. P. 6-7.
33. Cherkas, L., Grin, A., Schneider, K. (2011) A new approach to study limit cycles on a cylinder. Dynamics of continuous, discrete and impulsive systems Series A: Mathematical Analysis, Volume 18, 839 – 851.
34. Grin, A., Schneider, K. (2012) Andronov-Hopf bifurcation of higher codimensions in a Lienard system. International journal of bifurcation and chaos. Vol. 22. No 11. – P. 1250271 (17 pages).
35. Cherkas, L., Grin, A., Schneider, K. (2013): On the construction of bifurcation curves related to limit cycles of multiplicity three for planar vector fields. J. Comput. Appl. Math. Vol. 237, No 1. – P. 654 – 662.
36. Cherkas, L., Grin, A., Bulgakov V. (2013): Constructive methods for investigating limit cycles of autonomous systems of second order (numerical-algebraic approach). Yanka Kupala State University of Grodno. 489 p. (in Russian) *Research monograph*.

37. Grin, A., Schneider, K. (2013): On the construction of a class of generalized Kukles systems having at most one limit cycle. *Journal of Mathematical Analysis and Applications*. Vol. 408. P. 484 – 497.
38. Grin, A., Kuzmich V. (2013): About existence of a limit cycle in a class of generalized Kukles system. *Vesnik of Yanka Kupala State University of Grodno. Series 2. Mathematics. Physics. Informatics, Computer Technology and its Control*. № 3 (159). – P. 33 – 40 (in Russian).
39. Grin, A., Kuzmich V. (2014): The Dulac-Cherkas function in the neighborhood of weak focus of planar cubic autonomous system. *Vesnik of Yanka Kupala State University of Grodno. Series 2. Mathematics. Physics. Informatics, Computer Technology and its Control*. № 2 (173). – P. 36 – 43 (in Russian).
40. Grin, A. (2014): Dulac-Cherkas function in a neighborhood of a structurally unstable focus of an autonomous polynomial system on the plane. *Differential Equations*. Vol. 50. – № 1. – P. 1 – 7.
41. Grin, A. (2014): On the construction of bifurcation curves related to limit cycles of multiplicity three for planar vector fields. // *Abstracts of International congress of mathematicians, Seoul, 13–21 August 2014 / Korean Mathematical Society – Seoul, 2014*. – P. 314.
42. Grin, A. (2014): Estimate of the number of limit cycles of a second-order autonomous system and their localization. *Differential Equations*. Vol. 50. – № 10. – P. 1389 – 1390.
43. Hryn, A. (2015): On the estimation of limit cycles number for some planar autonomous systems. *Theoretical and computational methods in dynamical systems and fractal geometry: abstracts of the talks of the international workshop, Maribor, April 7–11*. – Maribor, 2015. – P. 19 – 20.
44. Kuzmich, A., Hryn A. (2016): On the uniqueness of limit cycle for a generalized Van der Pol system. *Vesnik BGU. Series 1. Fiz. Mat. Inform.* № 2 – P. 84 – 90 (in Russian).
45. Hryn, A. Generalized pendulum systems with prescribed number of limit cycles surrounding cylinder. *Abstracts 7th Podlasie Conference on Mathematics, Bialystok. 8–11 June 2016*. – Bialystok. 2016. – P. 44 – 45.
46. Kuzmich, A., Chen Yang, Hryn A. (2016): Dulac-Cherkas function for a perturbed Hamiltonian system on the plane. *Vesnik of Yanka Kupala State University of Grodno. Series 2. Mathematics. Physics. Informatics, Computer Technology and its Control*. Vol. 6 – № 3 – P. 19 – 28 (in Russian).
47. Grin, A., Kuzmich V. (2016): Precise estimations of limit cycles number of autonomous systems with three equilibrium points in the plane / A.A. Grin, A.V. Kuzmich // *Proceedings of the National Academy of Sciences of Belarus. Physics and Mathematics Series*. № 4. – P. 7–17 (in Russian).
48. Grin, A., Schneider, K. (2016): Study of the bifurcation of a multiple limit cycle of the second kind by means of a Dulac-Cherkas function: a case study. *International Journal of Bifurcation and Chaos*. Vol. 26 – № 14, 1650229 (9 pages).
49. Grin, A., Kuzmich V. (2017): Dulac-Cherkas criterion for exact estimation of the number of limit cycles. *Differential Equations*. Vol. 53. – № 2. – P. 171 – 179.
50. Kuzmich, A., Hryn A. (2017): On precise number of limit cycles of some autonomous systems with three stationary points on the plane. *Vesnik of Yanki Kupala State University of Grodno. Series 2. Mathematics. Physics. Informatics, Computer Technology and its Control*. Vol. 7. – № 2. – P. 30 – 40 (in Russian).
51. Grin, A.A., Schneider, K. (2017): Global bifurcation of a unique limit cycle in some class of planar systems // *International Workshop on the Qualitative Theory of Differential Equations « QUALITDE –2017»*: Abstracts of the International Workshop QUALITDE –2017, December 24-26, Tbilisi, Georgia. – P. 51–56.

52. Grin, A.A. Dulac-Cherkas Method for Detecting Exact Number of Limit Cycles for Planar Autonomous Systems/ A.A. Grin, A.V. Kuzmich // International Workshop on the Qualitative Theory of Differential Equations «QUALITDE –2018»: Abstracts of the International Workshop QUALITDE–2018, December 1-3, Tbilisi, Georgia. – P. 50–54.
53. Grin, A.A., Schneider, K. (2019): Construction of generalized pendulum equations with prescribed maximum number of limit cycles of the second kind. Dynamics of Continuous, Discrete and Impulsive Systems. Series A: Mathematical Analysis. № 26. – P. 69–88.
54. Grin, A.A., Rudevich, S. V. (2019): Dulac–Cherkas Test for Determining the Exact Number of Limit Cycles of Autonomous Systems on the Cylinder. Differential Equations. Vol. 55. – № 3. – P. 319 – 327.
55. Grin, A.A., Rudevich, S.V. (2019): Transversal curves in the task of detecting the limit cycles number of autonomous systems on cylinder. Vesnik of Yanka Kupala State University of Grodno. Series 2. Mathematics. Physics. Informatics, Computer Technology and its Control. Vol. 9 – № 2 – P. 39 – 49 (in Russian).
56. Hryn A. A., Rudzevich S.V. (2019): Ways for detection of the exact number of limit cycles of autonomous systems on the cylinder. Proceedings of the National Academy of Sciences of Belarus. Physics and Mathematics Series. Vol. 55, – № 2, – P. 182–194 (in Russian). <https://doi.org/10.29235/1561-2430-2019-55-2-182-194>
57. Grin, A.A. (2019): On the Detection of Exact Number of Limit Cycles for Autonomous Systems on the Cylinder / A. A. Grin, S. V. Rudevich // International Workshop on the Qualitative Theory of Differential Equations «QUALITDE –2019»: Abstracts of the International Workshop QUALITDE–2019, December 7-9, Tbilisi, Georgia. – P. 77–81.
58. Grin, A.A. (2020): Transversal Curves for Finding the Exact Number of Limit Cycles / A. A. Grin // Differential Equations. Vol. 56. – № 4. – P. 415–425.
59. Hryn A. A. (2020): Dulac - Cherkas functions for systems equivalent to the van der Pol equation. Proceedings of the National Academy of Sciences of Belarus. Physics and Mathematics Series. Vol. 56, – № 3, – P. 275–286 (in Russian). <https://doi.org/10.29235/1561-2430-2020-56-3-275-286>
60. Grin, A.A. (2020): On the construction of Dulac - Cherkas functions for systems equivalent to the van der Pol equation. Vesnik of Yanka Kupala State University of Grodno. Series 2. Mathematics. Physics. Informatics, Computer Technology and its Control. Vol. 9 – №3 – P. 16 – 25 (in Russian).
61. Grin, A.A. (2020): Global uniqueness of a limit cycle for a generalized planar autonomous van der Pol system. Vesnik of Yanka Kupala State University of Grodno. Series 2. Mathematics. Physics. Informatics, Computer Technology and its Control. Vol. 9 – №3 – P. 26 – 34.
62. Grin, A.A. (2020): Dulac-Cherkas Functions for Van Der Pol Equivalent Systems / A.A. Grin, K.R. Schneider // International Workshop on the Qualitative Theory of Differential Equations «QUALITDE –2020»: Abstracts of the International Workshop QUALITDE –2020, December 19-21, Tbilisi, Georgia. – P. 82–86.
63. Sadovski A.P., Cherginets D.N., Detchenia L.V., Grin, A.A. (2021): Seven-fold focus of cubic systems. Vesnik of Yanka Kupala State University of Grodno. Series 2. Mathematics. Physics. Informatics, Computer Technology and its Control. Vol. 11 – № 1 – P. 42 – 55 (in Russian).
64. Grin, A.A. The Precise Estimation of Limit Cycles Number for Planar Autonomous Systems / A.A. Grin, A.V. Kuzmich // "Mathematics & IT: Research and Education" (MITRE-2021), international conference (2021 ; Chişinău). International Conference "Mathematics & IT: Research and Education" (MITRE-2021): dedicated to the 75th anniversary of Moldova State University, July 1-3, 2021: Abstracts / scientific committee: Alexei Caşu [et al.]; organizing committee: Galina Rusu [et al.]. – Chişinău : CEP USM, 2021. – P. 38–39.
65. Pranevich, A. Conditional partial integrals of polynomial Hamiltonian systems / A. Pranevich, A. Grin, F. Munteanu, E. Musafirov, C. Sterbeti // Qualitative Theory of Differential

Equations: abstracts of International Workshop QUALITDE, Dedicated to the 130th birthday anniversary of Academician N. Muskhelishvili, Tbilisi, Georgia, December 18 – 20, 2021 / [Editorial board I. Kiguradze, R.P. Agarwal, R. Hakl at alias]; I. Javakhishvili Tbilisi State University. – Tbilisi: TSU, 2021. – P. 163 – 167.

66. Pranevich, A. Multiple partial integrals of polynomial Hamiltonian systems / A. Pranevich, A. Grin, E. Musafirov // *Acta et Commentationes, Exact and Natural Sciences*. – 2021. – Vol. 2 (12). – P. 33–42.

67. Pranevich, A. Darboux polynomials and first integrals of polynomial Hamiltonian systems / A. Pranevich, A. Grin, E. Musafirov // *Communications in Nonlinear Science and Numerical Simulation*. – 2022. – Vol. 109, No. 106338. – P. 1 – 12.

68. Musafirov, E. Admissible Perturbations of a Generalized Langford System / E. Musafirov, A. Grin, A. Pranevich // *International Journal of Bifurcation and Chaos*. – 2022. – Vol. 32 – № 3, 2250038 (11 pages).

69. Grin, A.A. Global Algebraic Poincaré–Bendixson Annulus for the van der Pol System / A. A. Grin, K. R. Schneider // *Differential Equations* – 2022. – Vol. 58. – № 3. – C. 285–295.

70. Hryn A. A., Musafirov E. V., Pranevich A. F. A real autonomous quadratic system of three differential equations with an infinite number of limit cycles. // *Proceedings of the National Academy of Sciences of Belarus. Physics and Mathematics Series*. – 2022. – Vol. 58, № 2. P. 135–143 (in Russian).

71. 3D Quadratic ODE systems with an infinite number of limit cycles / E. Musafirov, A. Grin, A. Pranevich, F. Munteanu, C. Sterbeti // *Abstracts of the International Conference On Applied Mathematics and Numerical Methods, June 29–July 2, Craiova*. – Craiova : 2022. – P. 31.

72. Musafirov E. 3D Quadratic ODE systems with an infinite number of limit cycles // *Eduard Musafirov, Alexander Grin, Andrei Pranevich, Florian Munteanu, Cătălin Șterbeți. ITM Web Conf. 49 02006 (2022) DOI: 10.1051/itmconf/20224902006*

73. Pranevich, A. Non-Autonomous First Integrals of Autonomous Polynomial Hamiltonian Systems / A. Pranevich, A. Grin, E. Musafirov, F. Munteanu, C. Sterbeti // *International Workshop on the Qualitative Theory of Differential Equations: reports of QUALITDE, Volume 1, Tbilisi, Georgia, December 17 – 19, 2022 / I. Javakhishvili Tbilisi State University*. – Tbilisi: TSU, 2022. – P. 174 – 178.

74. Pranevich A., Grin A., Musafirov E., Complex-valued Darboux polynomials of real polynomial hamiltonian systems // *Analytic Methods of Analysis and Differential Equations: AMADE 2021 (S. Rogosin, M. Dubatovskaya (Eds.))*. – Cottenham: Cambridge Scientific Publishers, 2023. – P. 51–64.

Besides there are 80 publications more (papers in journals and preprints as well as theses and proceedings of conferences and etc.).