

Report of "Differential equations" department for 2015.

The department consists of 20 collaborators. 19 of them are research associates including 11 doctors of sciences, 5 philosophy doctors. In 2015, by the plan 14 scientific research works on one theme are carried out. The carried out scientific works:

Theme: Investigating boundary value problems for differential equations.

Work1. Investigating global solution of the Cauchy problem for a pseudohyperbolic equation with fractal derivative dissipation.

Ex: d.ph.m.sci.prof. A.B.Aliyev, r.a.Mammadzade K.S.

Existence of absence of global solution of the Cauchy problem for a class of semilinear pseudohyperbolic equation with semilinear structural dissipation was studied. In the paper in the domain $[0, \infty) \times R^n$ the Cauchy problem

$$u_{tt} - \Delta u_{tt} + \Delta^2 u + (-\Delta)^\alpha u_t = f(u), \quad (1)$$

$$u(0, x) = \varphi(x), u_t(0, x) = \psi(x), \quad (2)$$

was considered and necessary conditions for the existence and absence of global solution were found. Here $0 \leq \alpha \leq 1$ is Δ -Laplace operator, $(-\Delta)^\alpha = F^{-1}[|\xi|^{2\alpha} F[.]]$ is Fourier transform.

1. *Aliyev A.B., Pashayev A.V. The Cauchy problem for a class of semilinear pseudoparabolic equations of fourth order with structural dissipation.*

Doclady AN Rossii. 2015, vol465, № 1, p. 1–4

2. *Aliyev A.B., Kazimov A.P. No global solutions of the Cauchy problem for the system of Klein-Gordon equations with fixed positive energy. Differential equations.*

3. *Aliyev A.B., Isayeva S.E. Global attractor for a class of semilinear hyperbolic equation with memory operator. Zhurnal Vychos.mat. i mat. fiziki. 2015, vol 465, № 1, p. 1–4*

4. **Aliiev A. B., Pashayev A. F.** *The Global Solvability Cauchy Problem for the Fourth Order Semilinear Pseudohyperbolic Equation with Structural Damping VI Annual International Conference of the Georgian Mathematical Union, Abstracts of Participants' Talks Batumi, July 12–16, 2015, p.60.*
5. **Aliyev A.B., Yusifova Ç.Z.** *Existence and non-existence of global solutions of the Cauchy problem for systems of three semilinear Klein-Gordon equations with dissipations. The VII International Conference “Functional-differential equations and their applications”. Mahachkala, September 21-24, 2015.*
6. **Aliyev A.B., Mamedov F.B.** *Existence of global solutions of a mixed problem for a class of semi-linear hyperbolic equations with nonlinear dissipation and unisotropic elliptic part. September 21-24, 2015.*
7. **Gasimova V. F., Mammadzade K.** *Global Existence and energy decay of solution for a class system of fourth order semi-linear hyperbolic equations with damping and source terms. International Conference "Mathematical Analysis, Differential Equations and their Applications, MADEA-7, p.53, Baku, Azerbaijan, September 08-13, 2015.*
8. **Mamedov F.** *Existence and asymptotic behavior of solutions of the mixed problem for semilinear hyperbolic equations, with weak nonlinear dissipation, source terms and anisotropic elliptic part. International Conference "Mathematical Analysis, Differential Equations and their Applications, MADEA-7, p. 106, Baku, Azerbaijan, September 08-13, 2015.*
9. **Rustamova S.** *Consider the Cauchy problem for a system of wave equations with damping and source terms. International Conference "Mathematical Analysis, Differential Equations and their Applications, MADEA-7, p. 139, Baku, Azerbaijan, September 08-13, 2015.*

10. **Rustamova S.O.** Existence of global solutions of a mixed problem for a system of semilinear hyperbolic equations with nonlinear dissipation. September 21-24, 2015.

Work 2. Investigating the spectrum and trace of a boundary value problem for a fourth order differential equation with operator coefficient.

Ex: doc.ph.mat.sci.prof. B. Bayramoğlu, doct. In math. N.M Aslanova.

In the space $L_2((0,1)H)$

1. **Aslanova N.M., Bayramoglu M.** On spectrum and trace formula for one class of singular problems // *Analele Stiintifice ale Universitatii "Al.I. Cuza" din Iasi, Matematica*. 11 pages. (çapaqəbul olunmuşdur)

2. **Aslanova N.M., Bayramoglu M., Aslanov Kh.M.** Boundary value problems for fourth order differential-operator equations. //MADEA Azerbaijan-Turkey-Ukrainian, International conference, Mathematical Analysis, Differential equations and their applications, Abstracts, September 08-13, 2015, Baku –Azerbaijan p.25

Work 3. Necessary conditions for optimal control problems.

Ex.: doct.ph.m.s., prof. M.J.Mardanov, doct.ph.m.s., prof. T.Melikov

1. **Mardanov Misir J., Malik Samin T. and Mahmudov Nazim I.** "On the theory of necessary optimality conditions in discrete systems". *Advances in Difference Equations* (2015) 2015:28, DOI 10.1186/s13662-015-0363-4, 15 pages, impact factor 0,640.

2. **Mardanov M. J., Sharifov Y. A.** "Pontryagin's Maximum Principle for the Optimal Control Problems with Multipoint Boundary Conditions", *Abstract and Applied Analysis*, vol. 2015, Article ID 428042, 6 pages, 2015. doi:10.1155/2015/428042, Impact factor 1,274.

3. **Mardanov M.J., Melikov T.K., Mahmudov N.I.** "On necessary optimality conditions in discrete control systems", *International Journal of Control*, 2015, 11 pages, Impact factor 0,954, <http://dx.doi.org/10.1080/00207179.2015.1035756>.

4. **Mardanov M.J., Mahmudov N.I., Sharifov Y. A.** “Existence and uniqueness results for q -fractional difference equations with p -Laplacian operators”, *Advances in Difference Equations* (2015) 2015:185 ,DOI 10.1186/s13662-015-0532-5. *impakt factor*:0,640

5. **Mardanov Misir J. and Mansimov Kamil B.** “Necessary Optimality Conditions of quasi-singular controls in optimal control”, *Proceedings of the institute of mathematics and mechanics*, v. 41, № 1, 2015, pp. 113-122.

6. **Mardanov Misir J. and Mansimov Kamil B.** “Necessary Optimality Conditions In An Optimal Control Problem With Integro-Differential Equations Equality And Inequality Type Multipoint Functional Restraints” , *Transactions of National Academy of Sciences of Azerbaijan, Series of Physical-Technical and Mathematical Sciences*, vol. xxxv, No 1, pp. 59-65, 2015.

7. **Mardanov Misir J. and Sharifov Yagub A.** Existence results for first order nonlinear impulsive differential equations with nonlocal boundary conditions, *Advancements in Mathematical Sciences Proceedings of the International Conference on Advancements in Mathematical Sciences, Antalya, Turkey 5–7 November 2015*, pp.5.

8. **Mardanov Misir J. and Sharifov Yagub A.** Existence and uniqueness results for q -difference equations with two-point boundary conditions, *Advancements in Mathematical Sciences Proceedings of the International Conference on Advancements in Mathematical Sciences, Antalya, Turkey 5–7 November 2015*, pp.4.

9. **Mardanov M. J., Malik S. T.** On necessary optimality conditions in diskrete systems, *The Reports of National Academy of Sciences of Azerbaijan*, 2015, volume LXXI, № 1, pp. 6-9.

10. **Mardanov M. J., Malik S. T.** *Optimality conditions for nonsmooth control with discrete systems, MADEA-7, Azerbaijan-Turkey-Ukrainan International conference, September 08-13, 2015. Pp. 110-111.*

11. **Mardanov M. J., Melikov T. K.** *Necessary conditions in components for a discrete problem of an optimal equation, MADEA-7, Azerbaijan-Turkey-Ukrainan International conference, September 08-13, 2015. Pp. 111-112*

12. **Mardanov Misir J.** *On a history of development of the optimal control theory in Azerbaijan, The 5-th international conference on control and optimization with industrial applications, 27-29 august, 2015, pp. 27-28.*

13. **Mardanov M. J., Melikov T. K.** *On a strengthening of the discrete maximum principle, The 5-th international conference on control and optimization with industrial applications, 27-29 august, 2015, pp. 121-122.*

Work 4. On Vieman-Valiron type estimates for evolution equations

Ex.: doct.ph.m.s., prof. N.M.Suleymanov

1.Suleymanov N.M., Farajli D.E. On Viman-Valiron type estimates for evolution equations. International Conference "Mathematical Analysis, Differential Equations and their Applications, MADEA-7, p.163, Baku, Azerbaijan, September 08-13, 2015.

Work 5. Coercive estimates of solutions of nonlinear elliptic-parabolic equations.

Ex.: doct.ph.m.s., prof. T.S.Gadjiev, j.r.a. O.S. Aliyev

1.Gadjiev T.S., Sadykhova N. R. Removable singularities for some degenerate non-linear elliptic equations. Mathematica Aeterna, vol.5, 2015, no.1, pp.21-27.

2. **Gadjiev T.S.** Coersitive estimate of solutions elliptic-parabolic equations // *Proceedings of Institute of Mathematics and Mechanics of National Academy of Sciences of Azerbaijan*, 2015. (in print)

3. **Gadjiev T.S., Kerimova M.N. and AliyevKh.H.** The behavior of solutions degenerate elliptic-parabolic equations. *International Conference "Mathematical Analysis, Differential Equations and their Applications, MADEA-7*, p. 52, Baku, Azerbaijan, September 08-13, 2015.

4. **Gadjiev T.S., KerimovaM.N.** The behaviour solutions degenerate elliptic parabolic equations. *International works shop on operator theory and application, IWOTA*, p.67, Tbilisi, Batumi, 2015.

5. **Gadjiev T.S., Rasulov R.A.** Blow-up solutions some classes of the nonlinear parabolic equations. *International works shop on operator theory and application, IWOTA*, p.74, Tbilisi, Batumi, 2015.

6. **Gadjiev T.S., Rasulov R.A.** Behavior of solutions some classes of the nonlinear parabolic equations. *Problems of desicion making under uncertainties, PDMU-2015*. p.21.

7. **Gadjiev T.S.** On removable sets of solutions for nonuniformly elliptic equations. *Problems of desicion making under uncertainties, PDMU-2015*. p.21.

8. **Гаджиев Т.С., Алиев О.С.** Оптимизация размещения нефтяных скважин с целью максимизации извлечения углеводородов. "*Azərbaycan Neft Təsərrüfatı*" jurnalı, 2015, s.1-6 (in print).

9. **Gadjiev T.S., Aliyev O.S.** The estimates of solutions elliptic-parabolic equation. *Proceedings of Nakhichevan University*, 201, pp.6 (in print).

Work 6. Solvability of a boundary value problem for a second order elliptic type differential operator equation with quadratic spectral parameter.

Ex.: doct.ph.m.s., prof. B.A.Aliyev

1. **Алиев Б.А., Амирасланлы О.П.** Разрешимость краевых задач эллиптических дифференциально-операторных уравнений второго порядка со спектральным параметром в уравнении и в граничных условиях //

Proceedings of Institute of Mathematics and Mechanics of National Academy of Sciences of Azerbaijan, 2015. (in print)

2. **Aliiev B.A., Qurbanova N.K., Yakubov Y.S.** Solvability of the Regge boundary value problem and asymptotic behavior of eigenvalues of one abstract spectral problem. *Riv. Mat. Univ. Perma*, vol.6, 2015

3. **Алиев Б.А., Курбанов Н.К., Якубов Я.С.** Об одной краевой задаче для эллиптических дифференциально-операторных уравнений второго порядка с квадратичным спектральным параметром (*çaratəqdimolunmuşdur*).

4. **Aliiev B.A., Qurbanova N.K.** "Solvability of a boundary value problem for a second order elliptic differential-operator equation with a spectral parameter in the equation and in boundary conditions" VII International Conference "Mathematical Analysis, Differential Equations and their Applications, MADEA-7, p. 15, Baku, Azerbaijan, September 08-13, 2015.

5. **Алиев Б.А., Курбанов Н.К., Якубов Я.С.** Об одной краевой задаче для эллиптических дифференциально-операторных уравнений второго порядка с квадратичным спектральным параметром. VII Международная Конференция "Функционально-дифференциальные уравнения и их приложения", Махачкала, 21-24 сентября, 2015.

Work 7. Investigation of existence and uniqueness of solution of a clan of parabolic type equations with nonlocal integral boundary condition.

Ex.: R.A. Teymurov, doct.ph.m.s., prof. T.M. Akhmedov

1. **Ахмедов Тураб, Велиев Эльдар** – Дробные производные в граничных задачах электродинамики. – Германия LAP, LambertAcademicPublishing, 2015-264с.

2. **Teymurov R.A.** Control of the moving sources for wave equation // *Reports of the National Academy of Sciences of Azerbaijan*, 2015, v. LXXI, №1, pp.7-10.

3. **Теймуров Р.А.** Оптимальное управление подвижными источниками для уравнения теплопроводности // *Украинский Математический Журнал*. 2015 г., том 67, №7. – С.962-972.

4. **Теџмуров Р.А.** *Optimal scanning control for heat equation // IMA Journal of Mathematical Control and Information. OxfordUniversityJournals. 2015. doi: 10.1093/imamci/dnv041*

5. **Теџмуров Р.А.** *Об одной задаче оптимального управления подвижными источниками для процессов внутрипластового горения / Международная конференция по математической теории управления и механике, 3-7 июля, 2015, г. Суздаль, РФ. – С. 127-128.*

6. **Теџмуров Р.А.** *Optimal control of the mobile source for process of intra sheeted burning in oil production / 5-th International Conference on Control and Optimization with Industrial Applications, 27-29 August, 2015, Baku, Azerbaijan, pp. 169-171.*

7. **Теџмуров Р.А., Ахмедов Т.М.** *On the solvability of boundary value problem with nonlocal integral conditions for parabolic equation / 7-th International Conference on Mathematical Analysis, Differential Equation & Their Applications MADEA-7, 08-13 September, 2015, Baku, Azerbaijan, pp. 167-168.*

8. **Теџмуров Р.А.** *Об одной задаче оптимального управления движением фронта горения для процессов внутрипластового горения / XXVI Крымская Осенняя Математическая Школа-Симпозиум - КРОМШ (Крым, 17-29 сентября 2015 г.). Крымский Федеральный Университет им. В.И.Вернадского, 2015.–С.121-123.*

9. **Теџмуров Р.А., Ахмедов Т.М.** *Нелокальная краевая задача с интегральными условиями для уравнения параболического типа / VII Международная конференция «Функционально-дифференциальные уравнения и их приложения» (Республика Дагестан, Махачкала, 21-21 сентября 2015г.). Дагестанский Государственный Университет, 2015. –С.50-51.*

10. **Теџмуров Р.А.** *Задача оптимального управления движением фронта горения для процесса внутрипластового горения в добыче нефти / VIII Международная конференция имени академика И.И.Ляшко «Вычислительная и прикладная математика» (Киев, 9-10 октября 2015 г.). Киевский Национальный Университет им. Т.Шевченко, 2015.–С.83-85.*

11. *Akhmedov T.A., Teymurov R.A. The problem of optimization with control of mobile sources for the linear parabolic equation // Azerbaijan Journal of Mathematics. 2016, vol 6, №1, – С.2-12. (Çара qəbul edilmişdir)*

12. *Теймуров Р.А. О задаче оптимального управления подвижными источниками для параболического уравнения // Изв.РАН. Теория и системы управления. 2016 г., том 55, №1. (Çара qəbul edilmişdir)*

13. *Теймуров Р.А. Об одном классе задач оптимального управления с распределенными и сосредоточенными параметрами // РАН. Журнал вычислительной математики и математической физики. 2016 г., том 56, №3. (Çара qəbul edilmişdir)*

14. *Теймуров Р.А. Об одной задаче оптимального управления для линейного параболического уравнения // Сибирский математический журнал. 2016 г. том 57, №6. (Çара qəbul edilmişdir)*

Work 8. Solution a boundary value problem for a second order differential operator equation with variable operator coefficient.

Ex.: cand.ph.m.s., ass.prof. M.Balayev

1. *Balayev M.K. Nonlocal solvability of semilinear differential-operator equation in Banach space. Transactions of NASA., 7 pp., 2015 (Bu iş çapdadır).*

2. *Балаев М.К. Разрешимость эволюционного первого порядка с переменным оператором и нелокальными краевыми условиями в банаховом пространстве. (Bu iş çapdadır)*

3. *Балаев М.К. Разрешимость задачи Коши для линейных дифференциально-операторных уравнений с переменными операторными коэффициентами произвольного*

4. *Balayev M.K. Solvability of general boundary value problem with nonlocal conditions for second order differential-operator equation. / 7-th International Conference on Mathematical Analysis, Differential Equation & Their Applications MADEA-7, 08-13 September, 2015, Baku, Azerbaijan, p.29.*

5.M.K.Balayev. *On the solvability of a boundary value problem with nonlocal integral conditions and for parabolic equations / Azərbaycan Kooperasiya Universitetinin yaranmasının 50 illiyinə həsr edilmiş beynəlxalq konfransın materialları, 2015.*

Work 9. A priori estimates of the solution of a mixed problem for fourth order Sobolev type semilinear parabolic equations.

Ex.: A.G.Aliyeva

1. Алиева А.Г., Алиев С.Дж., Намазов Ф.М. О методике применения теоремы о пределе последовательности. Молодой ученый, научный журнал, г.Казань, №11 (91), 2015, с.1-4.

Work 10. Regularity of VMO coefficient parabolic equation in generalized weighted parabolic Morrey space.

Ex.: Sh.A.Muradova

1. MuradovaSh.A., Hamzayev V.H. Anisotropic maximal and singular integral operators in anisotropic generalized Morrey spaces. Transactions of IMM ANAS, 2014, vol.34, No.4, p.87-98.

2. Gadjeva E.A.,MuradovaSh.A., Hasanov A.A. Commutators of multilinear singular integral operators on generalized local Morrey spaces. Transactions of IMM ANAS, 2015, vol.35, No.2 (3), pp.19.

2. GuliyevVagif, MuradovaShamsiyya A., OmarovaMehriban N. and SoftovaLubomira G. Gradient estimates for parabolic equations in generalized weighted Morrey spaces". Accepted Acta Mathematica, 2015, 27pp.

3. MuradovaSh.A. "Anisotropic singular integral operators in anisotropic generalized Morrey spaces". / 7-th International Conference on Mathematical Analysis, Differential Equation & Their Applications MADEA-7, 08-13 September, 2015, Baku, Azerbaijan, p.119.

4. GuliyevVagif, MuradovaShamsiyya A., OmarovaMehriban N. On the gradient estimates for parabolic equations in generalized weighted Morrey spaces. VII

Международная Конференция "Функционально-дифференциальные уравнения и их приложения", Махачкала, 21-24 сентября, 2015.

Work 11. Asymptotics of the solution of a mixed problem stated for semilinear hyperbolic equation contained in hysterises.

Ex.:d.ph.m.sci.prof. A.B.Aliyev,cand.ph.m.s.,ass.prof. S.E.Isayeva

1.İsayeva S.E. Yaddaş operatoru daxil olan dörd tərtibli hiperbolik tənlik

üçün başlanğıc-sərhəd məsələsi. «Рийазийат вә механиканын актуал проблемляри» adlı respublika elmi конфрансыни материаллары.20-21 мау, Бакы-2015 (səh.48-49).

2. Шукюрова Г.Д., Исаева С.Э. Слабое решение смешанной задачи для полулинейных псевдогиперболических уравнений четвертого порядка с негладким коэффициентом. The way of Science. International scientific journal, №5(15), Volgograd, 2015 (səh.14-19).

3. Алиев А.Б., Исаева С.Э.Global attractor for a semilinear hyperbolic operator with a memory operator. Zhurnal Vychisl. math. ifiziki.Vol. 55, №4, pp. 1857-1869, 2015.

Work 12. Behavior of the solution of some nonlinear elliptic type equations.

Ex.: N.R.Ahmedzadeh

T.S.Gadjiev, N. R. Sadykhova. Removable singularities for some degenerate nonlinear elliptic equations. Mathematica Aeterna, vol.5, 2015, no.1, pp.21-27.

Work 13. Investigation of the Cauchy problem for Volterra claims by the inverse problem method

Ex.: A.Kh.Khanmamedov

1.А.Ханмаммедов. Задача рассеяния для системы Дирака с разрывным граничным условием//Journal of Contemporary Applied Mathematics, 2014, vol.4, №1, p. 16-19.

2. *А.Ханмаммедов. Операторы преобразования для дискретных операторов Штурма-Лиувилля//Journal of Contemporary Applied Mathematics, 2014, vol.4, №1, p. 111-115*

3. *А.Ханмаммедов. Задача Коши для полубесконечной цепочки Вольтерра с периодическим начальным условием //Proceedings of IAM, 2105, том 4, №1, с. 44-48.*

4. *А.Ханмаммедов. Асимптотически периодическое решение задачи Коши для ленгмюровской цепочки//Журнал вычислительной математики и математической физики, 2015, т.55, №12, с.72-77.*

Work 14. Some extremal problems with respect to the domain related with eigen numbers of different operators.

Ex.: Y.Gasimov

1. *Ю.С. Гасымов, Н.А. Аллахвердиева. Об одной экстремальной задаче для собственного значения оператора Паули, Proceeding of IAM, V.3, N.2, 2014, pp.205-211.*

2. *Agamalieva L.F., Aliev F.A., Gasimov Y.S. High accuracy algorithms to solution of the discrete synthesis problem with measurement errors, Ciencia e Tecnica Vitivincola, V.30, N.5, 2015, pp.29-36 (Impact Factor-0.2).*

Gasimov Y.S., Allahverdiyeva N.A. On an extremal problem the eigenvalue of Pauli's operator.

Social and scientific activity of the collaborators

1) Participation at the institute seminars: all of the collaborators.

2) Giving talks at the institute seminars:

a) Doctor in math. N.M. Aslanova. On 28.01.2015. On "Investigating asymptotics and trace of the spectrum of boundary value problems for second and fourth order differential-operator equations".

b) On 06.05.2015. doct. Ph.m.s. prof AkberAliyev on “Global solutions of the system of nonlinear hyperbolic equations”.

c) On 11.11.2015. sen.res.ass.doct. in math. Prof. Aqil Khanmamedov on “Integration of some nonlinear equations by the method of inverse spectral problem”.

3) Scientific subject seminar.

Collaborators of the department prof. AkberAliyev and prof. MammadBayramoglu are the members of scientific subject seminar.

4) Participation at Conferences.

a) Collaborators of the department MisirMardanov and TelmanMelikov, Nadir Suleymanov, NigarAslanova and MammadBayramoglu, ShamsiyyaMuradova, RafiqTeymurov, Mehdi Balayev participated at the VII International Conference MADEA-7 held on September 08-13, 2015 in Baku.

b) Y. Qasimov was a vise-chairman of the organizing committee of theInternational Conference COIA-2015 supported by ANAS.

c) A.B. Aliyev was a member of the programCommiteeof the VII International Conference “Functional-differential equations and their applications” held on September of 2015 on Mahachkala.

The collaborates of the department A.B.Aliyev, B.A.Aliyev, R.Teymurov, Sh.A.Muradova have sent their talks to the Conference.The talks were published on the proceedings of the Conference.

d) A.B.Aliyev and T.S.Haciyev have sent their talks for participating at the VI International Conference to be held in Georgia, Batumi.

5) Defends.

a) On April 10 2015 collaborator of the department OrkhanAliyev has defended dissertation work “Exceptional sets of the solution elliptic and parabolic equations in weighted spaces”. Supervisor: Tahir Haciyev.

b) On June 30 2015, the collaborator of the department NigarRahibqiziAhmedzade has defended dissertation work “Quality properties of the solution of degenerate elliptic type equations”. Supervisor: Tahir Hacıyev.

c) On June 30 2015 candidate for a degree Aygun Tahir qiziQarayeva has defended dissertation work “Convergence of spectral expansion on the system of adjoint vector functions”. Ex: VeliQurbanov.

6) Members of editorial boards of scientific journals. Prof A.B.Aliyev.

-Azerbaijan Mathematics Journal:

-Proceedings of IMM;

- Transactions of IMM;

-Caspian Journal of Applied Mathematics, Ecology and Economics.

Prof. M. Bayramoglu

-Proceedings of IMM;

-Balcan Journal of Mathematics

Y.Gasimov leading editor in the journal “Applied and Computational Mathematics”.

Scientific papers:

a) General amount of papers-27

b) papers published abroad(Tompson Reuters and high impact journals/ -20)

c) Abstracts and conference materials-31.

7) Important result obtained in the department- Asymptotics of the solution of a mixed problem stated for a semilinear hyperbolic equation contained on hysteresis.

Ex: d.ph.m.sci.prof. A.B.Aliyev, cand.ph.m.s.,ass.prof. S.E.Isayeva.

Short abstract of the work:

A mixed problem was studied for a class of hyperbolic equations

$$\frac{\partial^2 u}{\partial t^2} + \frac{\partial}{\partial t} [u + F(u)] - \Delta u + |u|^p u = f$$

with a class of semilinear memory operator. There $p > 0$, F is an operator acting on $M(\Omega; C^0([0, T]))$, i.e. acting from Ω to the space $C^0([0, T])$. A theorem on the existence of global minimal operator of the considered mixed problem was proved.