Foydalanilgan adabiyotlar

1. С.Г. Светуников, И.С. Светуников «Производственные функции комплексных переменных», Ленанд 2019 г.
2. Q. Safaeva, F. Mansurov "Iqtisodiyotda matematika"

ASYMPTOTIC REPRESENTATION OF BLOW-UP MODES OF PARABOLIC EQUATION NOT IN DIVERGENCE FORM WITH SOURCE

A.S. Matyakubov[1], J.O. Khasanov[2], M.O. Ismoilova[3]

[1,3] National university of Uzbekistan, [2]Urgench state university

E-mail: almasa@list.ru, jamshid_2425@mail.ru, orifjonovna.m9318@gmail.com

In this work we consider in $Q=\{(t,x):\ t>0,\ x\in R^N\}$ parabolic equation of nonlinear equation not in divergence form with source

$$\frac{\partial u}{\partial t}=u^{\alpha}\nabla\left(u^{m-1}\left|\nabla u^{k}\right|^{p-2}\nabla u\right)+u^{\beta} \qquad (1)$$

$$u(0,x)=u_0(x),\ x\in R^N \qquad (2)$$

where k,p,m,α,β the numerical parameters, $\nabla(\cdot)=grad_x(\cdot)$, t and $x\in R^N$ -respectively, the temporal and spatial coordinates, $u=u(x,t)\geq 0$ are the solution. The numerical parameter n characterizes the variable source of the nonlinear medium. The equation (1) describes the process of polytrophic filtration in a nonlinear two-componential medium with source. In the equation $u\geq 0$-means the pressure, $u^{\alpha}\nabla\left(u^{m-1}\left|\nabla u^{k}\right|^{p-2}\nabla u\right)$-filtration flow, u^{β}-power volume filtration source.

The equation (1) describes many physical phenomena [1-6]. In particular, at $\alpha=2, m=1, p=2, n=0$ for single equation in (1) it is encountered in plasma physics [6].

Theorem 1. A weak solution of the problem (1)-(2) has the following asymptotic form:

$$u_A(x,t) \approx c_1 (T-t)^{\frac{1}{1-\beta}} \left(a - \left(\frac{|x|}{\tau^{\frac{1}{p}}} \right)^{\frac{p}{p-1}} \right)^{\frac{(p-1)(k(p-2)-m+1)}{k(p-2)(k(p-2)+\alpha)+m-1}} \left(1+o(1)\right)$$

at $|x| \to a^{\frac{p-1}{p}} \tau^{\frac{1}{p}}$ where constant c_1.

References

1. Samarskii A.A., Galaktionov V.A., Kurdyumov S.P., Mikhailov A.P. Blow-up in Quasilinear Parabolic Equations. Walter de Grueter,Berlin, 1995, 4, P. 535.

2. Aripov M. Standard Equation's Methods for Solutions to Nonlinear problems. «Fan» Tashkent, 1988, 138 p.

3. Aripov M., Matyakubov A. S., To the qualitative properties of solution of system equations not in divergence form of polytrophic filtration in variable density, Nanosystems: Physics, Chemistry, Math., 2017, Volume 8, Issue 3, 317-322

4. Aripov M., Matyakubov A.S., On the asymptotic behavior of solutions of nonlinear parabolic systems of non-divergent equations,// Computational Technologies, , Mathematics, Mechanics and Informatics Issue № 3(86). The BULLETIN of KAZNU. 2015. pp. 275-282

5. Aripov M., Sadullaeva Sh. A. Computer modeling of nonlinear diffusion processes Tashkent University, 2020, 670 p.

6. Friedman A., Mcleod J. B. Blow up of solutions of nonlinear degenerate parabolic equations. Archive for Rational Mechanics and Analysis. 1986. 96 (1).

55-80.

ON ONE METHOD FOR CALCULATING MULTI-LAYER SOUND INSULATION INCLUDING LAYERS OF A FIBROUS POROUS MATERIAL

[1]A. Omonov, [2]Kh. Imomnazarov

[1]Tashkent State Economic University, [2]Institute of Computational Mathematics and Mathematical Geophysics SB RAS, Novosibirsk

The sound-insulating effect of a layer of a fibrous porous material combined with a multilayer sound insulation is due to physical processes associated, in the general case, with the formation of two types of elastic vibrations. The first of them is fluctuations in the air volume filling the pore