



**ACADEMICA**  
**An International  
 Multidisciplinary  
 Research Journal**  
 (Double Blind Refereed & Peer Reviewed Journal)



**DOI: 10.5958/2249-7137.2021.00859.4**

## A GRAPH IN THE FORM OF A TRIANGLE WITH ATTACHED OUTGOING EDGES AT EACH VERTEX

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### ABSTRACT

*We study one incoming, two outgoing and triangle graphs for the equation of linear KdV. Using the theory of potentials, we reduce the problem to systems of linear integral equations and show that they are uniquely solvable under conditions of the uniqueness theorem.*

**KEYWORDS:** *Third Order PDE, Boundary Value Problem, Method Of Energy Integrals, Method Of Potentials, Initial Condition, Boundary Condition, Integral Equation.*

### REFERENCES

1. S.Abdinazarov. The general boundary value problem for the third order equation with multiple characteristics (in Russian). Differential Equations, 1881, 3(1). Pp. 3-12.
2. J.L.Bona and A.S. Fokas. Initial-boundary-value problems for linear and integrable nonlinear dispersive partial differential equations. Nonlinearity, 2008. 21. Pp. 195-203.
3. L.Cattabriga. Unproblema al contorno per una equazione parabolica di ordine dispari. Annalidella Scuola Normale Superiore di Pisa a mat. Serie III. 13(2), 1959.
4. J.E.Colliander, C.E.Kenig. The generalized Korteweg-de Vries equation on the half line. Commun. Partial Differ. Equations, 2002. 27(11-12). Pp. 2187-2266.
5. T.D.Djuraev. Boundary value problems for mixed and mixed-composite type equations. (in Russian). Fan Tashkent, 1979.

6. A.V.Faminskii, N.A.Larkin Initial-boundary value problems for quasi linear dispersive equations posed on a bounded interval. *Electron. J. Differ. Equ.*, 2010. 2010(20).
7. A.S.Fokas and L.Y.Sung. Initial boundary value problems for linear dispersive evolution equations on the half line. Technical report of Industrial Mathematics Institute at the University of South Carolina, 1999.
8. M.Rahimy. Applications of fractional differential equations. *Applied Mathematical Sciences*. 2010, 4(50). Pp. 2453-2461.
9. R.Gorenflo, F.Mainard. Fractional calculus: Integral and differential equations of fractional order. arXiv:0805.3823v1, 2008.
10. E.Taflin. Analytic linearization of the Korteweg-De Vries equation. *Pacific Journal of Mathematics*. 1983. 108(1).
11. V.Belashov, S.Vladimirov. Solitary waves in dispersive complex media: theory, simulation, application. Springer. 2005.
12. G.B.Whithan. Linear and nonlinear waves. *Pure and Applied Mathematics*. Wiley-Interscience. 1974.
13. Z.A.Sobirov, H.Uecker, M.Akhmedov. Exact solutions of the Cauchy problem for the linearized KdV equation on metric star graphs. *Uz.Math. J.* 2015. 3.
14. A.R.Khashimov. Some properties of the fundamental solutions of non-stationary third order composite type equation in multidimensional domains. *Journal of Nonlinear Evolution Equations and Applications*. January 2013. 2013(1). Pp. 1-9.
15. М.И.Ахмедов. Краевая задача для нестационарного уравнения третьего порядка составного типа в неограниченной области. *Вестник НУУз* 2017 2/1 Pp 64-74.
16. Z.A.Sobirov, M.I.Akhmedov, H.Uecker. Cauchy problem for the linearized KdV equation on general metric star graphs. *Nanosystems: Physics, Chemistry, Mathematics*, 2015, 6(2). Pp. 198-204.
17. Z.A.Sobirov, M.I.Akhmedov, O.V.Karpova, B.Jabbarova. Linearized KdV equation on a metric graph. *Nanosystems: Physics, Chemistry, Mathematics*, 2015, 6(6). Pp. 757-761.
18. M.I.Akhmedov, Z.A.Sobirov, M.R.Eshimbetov, Initial boundary value problem the linearized KdV equation on simple metric star graph. *Uz.Math.J.* 2017. 4. Pp.13-21
19. D.Noja Nonlinear Schrödinger equations on graphs : recent results and open problems, *Phil.Trans. Roy Soc. A*, 372, 20130002, 20 pages, (2014)
20. D. Mugnolo, D. Noja, C. Seifert: Airy-type evolution equations of star graphs. submitted. arXiv-Preprint 1608.01461.
21. D. Mugnolo, D. Noja and C. Seifert, Airy-type evolution equations on star graphs, *Anal. PDE*, V. 11, (2018), 1625-1652. 3, 4, 5, 6, 7, 9, 19