

On the boundedness of solution of the Schrödinger differential equation with time involution

Allaberen Ashyralyev^{1,2,3}, Twana Abbas⁴

¹ *Department of Mathematics, Near East University, Nicosia, TRNC, Mersin 10, Turkey,*

² *Peoples Friendship University Russia, Ul Miklukho Maklaya 6, Moscow 117198, Russia,*

³ *Institute of Mathematics and Mathematical Modeling, 050010, Almaty, Kazakhstan*

aallaberen@gmail.com

⁴ *Department of Mathematics, College of Education, Iraq twana.margaret@gmail.com*

Abstract: In the present work, the initial value problem for the Schrödinger type involutory partial differential equation is studied. Applying Green's function of space operator, we get formula for solution of this problem. In applications, the theorem on stability of this problem is established. Furthermore, this formula is applied to the existence and uniqueness of bounded solution of nonlinear problem with involution.

Keywords: Schrödinger type differential equation, boundedness, involution

2010 Mathematics Subject Classification: 35J25, 47E05, 34B27

REFERENCES

- [1] A. Ashyralyev, A. M. Sarsenbi, Well-posedness of an elliptic equation with involution, *Electronic Journal of Differential Equations* 2015(284), 1–8, 2015.
- [2] A. Ashyralyev, A. M. Sarsenbi, Well-posedness of a parabolic equation with the involution, *Numerical Functional Analysis and Optimization* 38(10) 1295-1304, 2017.
- [3] A. Ashyralyev, T. Abbas, A numerical algorithm for the involutory Schrödinger type problem, *Third International Conference of Mathematical Sciences (ICMS 2019) AIP Conf. Proc.* 2183, 070015-1–070015-3; <https://doi.org/10.1063/1.5136177>, 2019.