

2nd International Conference and Exhibition on

Satellite & Space Missions

July 21-23, 2016 Berlin, Germany

Interconnection of special solutions and types of equations describing the dynamic state of the plasma

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The type of equation defines entirely the solutions of this equation and properties of respective dynamical system. However, there exist often difficulties to find the exact solutions of equations of mathematical physics, in particular, in the equations describing the dynamic state of the plasma. Therefore, we consider a class of nonlinear differential equations depending on the order and type of nonlinearity of these equations. The nonlinearity type is determined by the coefficient of the highest derivative of the unknown function and by the linearity or non-linearity of other terms of equation. As a result, we obtain 4 types of quasi-linear partial differential equations. It has been found that the solution solutions occur in the equations of the third type. Therefore, we can speak about a necessary condition for the existence of solution solutions in the corresponding equation. We also define a class of equations for which the dispersion ratio is carried out. This ratio is a necessary condition for the existence of solution solutions and the satisfying properties of these solutions.

Biography

Yuliya F Novik is a staff member of the Laboratory of Self-Organization System Modeling at the United Institute of Informatics Problems of the National Academy of Sciences of Belarus. She graduated from the Belarusian State University, Department of Mechanics and Mathematics in 2015. She is studying a Master's program at the Researcher Training Institute of the National Academy of Sciences of Belarus. Her scientific supervisor is Professor, DSc Alexander M Krot. She has published 8 scientific works including 1 article in refereed journal.

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