

UDC 512.813+517.957.6

CLASSIFICATION OF SYMMETRY REDUCTIONS FOR SOME P(1,4)-INVARIANT PARTIAL DIFFERENTIAL EQUATIONS

Vasyl Fedorchuk, Volodymyr Fedorchuk

Pidstryhach Institute for Applied Problems of Mechanics and Mathematics, NAS of Ukraine

vasfed@gmail.com, volfed@gmail.com

We have investigated the relationship between the structural properties of low-dimensional ($\dim L \leq 3$) nonconjugate subalgebras of the Lie algebra of the generalized Poincaré group P(1,4) and types of symmetry reduction for the following (1+3)-dimensional PDEs:

- Eikonal equation,
- Euler-Lagrange-Born-Infeld equation,
- Homogeneous Monge-Ampère equation,
- Inhomogeneous Monge-Ampère equation.

In our talk, we plan to present some of the results obtained [1 – 5].

1. *Fedorchuk V., Fedorchuk V.* On classification of symmetry reductions for the Eikonal equation // *Symmetry*. – 2016. – **8**. – Art. 51. – 32 p.
2. *Fedorchuk V., Fedorchuk V.* Classification of symmetry reductions for the Eikonal equation. – Lviv: Pidstryhach Institute for Applied Problems of Mechanics and Mathematics of NAS of Ukraine, 2018. – 176 p.
3. *Fedorchuk V.M., Fedorchuk V.I.* On the classification of symmetry reduction and invariant solutions for the Euler-Lagrange-Born-Infeld equation // *Ukr. J. Phys.* – 2019. – **64**, No. 12. – P. 1103–1107.
4. *Fedorchuk V.M., Fedorchuk V.I.* On symmetry reduction of the (1 + 3)-dimensional inhomogeneous Monge-Ampère Equation to the first-order ODEs // *Applied Mathematics*. – 2020. – **11**, No. 11. – P. 1178–1195.
5. *Fedorchuk V.M., Fedorchuk V.I.* Reduction of the (1 + 3)-dimensional Inhomogeneous Monge-Ampère equation to first-order partial differential equations // *Ukrain. Math. Journ.* – 2022. – **74**, No. 3. – P. 472–483.

КЛАСИФІКАЦІЯ СИМЕТРИЙНИХ РЕДУКЦІЙ ДЛЯ ДЕЯКИХ P(1,4)-ІНВАНІАНТНИХ ДИФЕРЕНЦІАЛЬНИХ РІВНЯНЬ З ЧАСТИННИМИ ПОХІДНИМИ

Проведено класифікацію симетрійних редукцій для деяких (1+3)-вимірних P(1,4)-інваріантних диференціальних рівнянь з частинними похідними.

http://iapmm.lviv.ua/mpmm2023/materials/ma09_02.pdf