



ЮЖНЫЙ ФЕДЕРАЛЬНЫЙ УНИВЕРСИТЕТ
Региональный математический центр
SOUTHERN FEDERAL UNIVERSITY
Regional Mathematical Center
<https://rmc.sfedu.ru/>, Rostov-on-Don, Russia

International scientific online seminar on Analysis, Differential Equations and Mathematical Physics

Coordinators: Prof. Alexey Karapetyants, Prof. Vladislav Kravchenko

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Characteristic Lie algebra of Klein-Gordon equation and higher symmetries

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Consider Klein-Gordon equation written in the form $u_{xy} = f(u)$. We define characteristic Lie algebra $\chi(f)$ as a Lie subalgebra in the Lie algebra of differential operators generated by two operators

$$X_0 = \frac{\partial}{\partial y}, X_f = \frac{\partial}{\partial u_1} + D(f) \frac{\partial}{\partial u_2} + \dots + D^{n-1}(f) \frac{\partial}{\partial u_n} + \dots,$$

where $D = u_1 \frac{\partial}{\partial u} + u_2 \frac{\partial}{\partial u_1} + \dots + u_{n+1} \frac{\partial}{\partial u_n} + \dots$. The properties of the characteristic Lie algebra $\chi(f)$ are related to the integrability of Klein-Gordon equation. We are going to discuss characteristic Lie algebras of two integrable cases: sine-Gordon $f(u) = \sinh h$ equation and Tzitzeica $f(u) = e^u + e^{2u}$ equation.

*Seminar website: <https://msrn.sfedu.ru/sl>. The seminar uses Microsoft Teams online platform.
Please send questions to tatandreeva@sfedu.ru (Tatiana Andreeva, scientific secretary).

The seminar is organized by the Regional Mathematical Center of the Southern Federal University in collaboration with Institute of Mathematics, Mechanics and Computer Sciences of the Southern Federal University and the special Interest ISAAC-OTHA group in Operator Theory and Harmonic Analysis.

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