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Boris Kruglikov, Andriy Panasyuk

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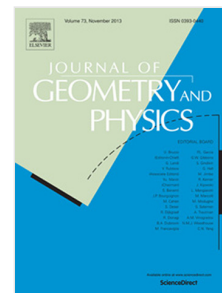
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Veronese webs and nonlinear PDEs

Boris Kruglikov^{a,b}, Andriy Panasyuk^{c,*}

^a*Department of Mathematics and Statistics, University of Tromsø, 90-37 Tromsø, Norway*

^b*Department of Mathematics and Natural Sciences, University of Stavanger, 40-36 Stavanger, Norway*

^c*Faculty of Mathematics and Computer Science, University of Warmia and Mazury, ul. Stoneczna 54, 10-710 Olsztyn, Poland*

Abstract

Veronese webs are closely related to bi-Hamiltonian systems, as was shown by Gelfand and Zakharevich. Recently a correspondence between Veronese three-dimensional webs and three-dimensional Einstein–Weyl structures of hyper-CR type was established. The latter were parametrized by Dunajski and Krynski via the solutions of the dispersionless Hirota equation. In this paper we show relations of Veronese three-dimensional webs to several other integrable equations, deform these equations preserving integrability via a dispersionless Lax pair and compute the corresponding contact symmetries, Bäcklund transformations and Einstein–Weyl structures. Realization of Veronese webs through solutions of these deformed integrable PDE is based on a correspondence between partially integrable Nijenhuis operators to the operator fields with vanishing Nijenhuis tensor. This correspondence could be used to construct a link between bi-Hamiltonian finite-dimensional integrable systems and dispersionless integrable PDE related to the Veronese webs.

Keywords: Integable system, Veronese web, nonlinear PDE, dispersionless Hirota equation, Nijenhuis tensor

*Corresponding author

Email addresses: `boris.kruglikov@uit.no` (Boris Kruglikov),
`panas@matman.uwm.edu.pl` (Andriy Panasyuk)

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