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Non-local Poisson structures and applications to the theory of integrable systems

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Dedicated to Minoru Wakimoto on his 70th birthday

Abstract. We develop a rigorous theory of non-local Poisson structures, built on the notion of a non-local Poisson vertex algebra. As an application, we find conditions that guarantee applicability of the Lenard–Magri scheme of integrability to a pair of compatible non-local Poisson structures. We apply this scheme to several such pairs, proving thereby integrability of various evolution equations, as well as hyperbolic equations.

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