

Orthogonal coordinates on R^n and integrable systems

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Abstract

The study of orthogonal coordinates on R^n (i.e., flat orthogonal metrics) is one of the central subjects in classical differential geometry. Dupin, Darboux and Bianchi developed many beautiful results. These flat orthogonal metrics also occur in the recent theory of integrable systems. In this talk, I will give a survey of the relation between flat orthogonal metrics and the work of Dubrovin, Novikov and Tsarev on completely integrable hydrodynamic systems, and also explain how these metrics arise from solutions of the n-wave equation associated to orthogonal groups.