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Integrable evolution equations on spaces of tensor densities.

We study a family of equations defined on the space of tensor densities of weight λ on the circle and introduce two integrable PDE. One of the equations turns out to be closely related to the inviscid Burgers equation while the other has not been identified in any form before. We present their Lax pair formulations and describe their bi-Hamiltonian structures. We prove local wellposedness of the corresponding Cauchy problem and include results on blow-up as well as global existence of solutions. We argue that there is a natural geometric framework for these equations that includes other well-known integrable equations and which is based on V. Arnold's approach to Euler equations on Lie groups (joint work with J. Lenells and G. Misiolek). (Received February 09, 2010)