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201-0003. *General Lie algebra extensions and extended Euler equations.*

In the first place, we deal with extensions of the Lie algebra of conformal Killing vector fields on a compact Riemannian manifold and lead some extended Euler equations which are concerned with the higher dimensional shallow water equation. In particular, we consider the Lie algebra extension of conformal Killing vector fields on a compact Einstein manifold. In the second place, we treat a one-dimensional general extension of the Lie algebra of vector fields on the circle, which is equipped with a non-standard bracket and a non-trivial representation, and obtain a certain extended Euler equation related with an infinite dimensional analogue of Heisenberg algebra. (Received August 22, 2009)