Mathematics > Analysis of PDEs

The Burgers equation and the Korteweg-de Vries equation with quadratic nonlinearity

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We study generalized variants of the Burgers equation and the KdV equation on the circle. The main goal of the paper is to show that both extensions can be recast as geodesic equations on a suitable diffeomorphism group of the circle and the corresponding Bott-Virasoro group respectively. As a consequence we obtain that the initial value problem for the Burgers equation with an additional quadratic term is well-posed on a scale of Sobolev spaces on the circle.

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