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**CLASSICAL AND GENERALIZED INVARIANT SOLUTIONS
OF THE RELAXING HYDRODYNAMICS EQUATIONS**

Abstract. We analyze the set of invariant travelling wave solutions of the relaxing hydrodynamics models and state the conditions that guarantee the existence of periodic solutions and limiting to them soliton-like regimes. We also study the existence of the shock wave invariant solutions. In some special case the periodic invariant solution is shown to give rise to the blow-up regime.

Keywords: nonlocal models, symmetry, self-similar reduction, qualitative analysis, limit cycle, shock wave solutions, blow-up regimes.

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