

# Significance and Novelty of this Paper

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The GPR model of continuum mechanics presents an exciting possibility of being able to describe both fluids and solids within the same mathematical framework. This has the potential to streamline development of simulation software and reduce the amount of theoretical work required. In addition, its hyperbolic nature precludes the model from exhibiting non-physical instantaneous transmission of information, and makes it more amenable to parallelization.

This paper presents a new second-order method for solving the GPR model that is significantly computationally cheaper and simpler to implement than existing methods. Some novel analytical results regarding the model are also presented and used. It is suggested that this method will prove useful in the practical implementation of the GPR model for simulation purposes.