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Classification of traveling wave solutions to the Green–Naghdi model

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Research highlights:

1. A qualitative method for differential equations is applied to classify all traveling wave solutions to GN model in specified parameter region of the parameter space.

2. The limiting behavior of all smooth and non-smooth periodic solutions of GN model as the parameters tend to some special values is studied.

3. Based on the qualitative results, all exact explicit expressions of traveling wave solutions are given.

4. With the aid of mathematical software Maple, all wave profiles of the obtained traveling wave solutions are also presented.

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