Computerized Symbolic Computation on a Sixth-order Model for Liquid Waves in the Presence of Surface Tension or a Floating Ice

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Computerized symbolic computation reflects the rapid expansion of computer sciences in various fields of science and engineering, while the studies on the liquid surfaces for rivers, oceans, aviation kerosene, liquid propellant for rockets, etc., are of current interest. In the presence of surface tension or sea ice, and with symbolic computation, the Hărăgus-Courcelle-Il'ichev model for surface liquid waves is hereby investigated. Several similarity reductions are presented, some of which are explicitly written out as exact analytic solutions having their rational expressions with respect to the dimensionless spatial variables of the model.

Key words: Symbolic Computations; Liquid Waves in the Presence of Surface Tension or a Floating Ice; Similarity Reductions; Exact Analytic Solutions