Editorial

Editorial Conclusion for the Special Issue "Applications of Symmetric Functions Theory to Certain Fields"

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In this Special Issue, the recent advances in the applications of symmetric functions for mathematics and mathematical physics are reviewed, including many novel techniques in analytic functions, transformation methods, economic growth models, and Hurwitz–Lerch zeta functions that were developed to provide reliable solutions to combinatorial problems. Most importantly, the methods proposed and discussed in this Special Issue have high generality and tolerance, which can be effectively applied in other mathematical areas with necessary extensions.

Regarding the important role of symmetric functions on analytic functions and recent advances related to mathematical physics, statistics, economics, and so on, the guest editors conducted a selective comprehensive review process for each submission based on the journal's policy and guidelines. For this Special Issue, we received 21 submissions, and after a comprehensive review process, 6 high-quality works were accepted for publication (the acceptance rate was around 0.29).

Taj et al. [1] introduced a subclass of starlike functions associated with the q-analogue of the sine function defined in symmetric unit disk. They investigated the sharp coefficient bounds and upper bound of the third-order Hankel determinant for this class. Mondal [2] obtained three types of analytic functions based on their infinite product representation. Mondal studied the radius of the k-parabolic starlikeness of the functions of these classes. Mondal also determined the optimal parameter values for k-parabolic starlike functions in the unit disk. Several examples were also given, including special functions, such as Bessel, Struve, Lommel, and q-Bessel functions. Johansyah et al. [3] solved the economic growth acceleration model with memory effects for the quadratic cost function (Riccati fractional differential equation), using a combined theorem of Adomian polynomial decomposition and Kashuri–Fundo transformation methods. They analysed the economic growth model (EGM) with memory effects for the quadratic cost function by modifying the linear fractional differential equation. Their significant contribution was to develop a linear cost function in the EGM for a quadratic non-linear cost function and determine the specific conditions of the Riccati fractional differential equations (RFDEs) in the EGM with memory effects. The results given in [3] showed that RFDEs in the EGM involving the memory effect have a solution and singularity. Additionally, the paper presented a comparison of exact solutions using Lie symmetry and a combined theorem of Adomian polynomial decomposition and Kashuri–Fundo transformation methods.

In another interesting study, Reynolds [4] proposed to evaluate a quadruple integral involving the Chebyshev polynomial of the first kind $T_n(x)$, which they derived in terms of the Hurwitz–Lerch zeta function. By making use of a q-differential operator, Shi et al. [5] introduced a new class of meromorphic multivalent close-to-convex functions. Furthermore, they derived some useful properties, such as sufficiency criteria, coefficient estimates, distortion and growth theorems, and radii of starlikeness and convexity for this new subclass.

In addition, Jia et al. [6] developed two new Bailey lattices and defined a number of new-form q-multisums with multiple variables for the basic hypergeometric series, which arose as consequences of these two new Bailey lattices. As applications, they derived two new transformations for basic hypergeometry using the unit Bailey pair.

In conclusion, the guest editors have done their best in selecting papers covering the major topics of symmetric functions to adequately contribute to the existing literature and fill in several critical gaps in the critical work on theory. The guest editors would like to thank the Editor-in-Chief, Prof. Dr. Sergei D. Odintsov, as well as the editorial team and the reviewers of *Symmetry*, who helped us in the journey to publish this Special Issue.

References

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