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Periodicity on quantum calculus: averaging results and Massera's theorem

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Resumen.
Quantum calculus (q-calculus) has recently been attracting the attention of many researchers, since it is a powerful tool for applications in several fields of physics such as cosmic strings and black holes, conformal quantum mechanics, nuclear and high energy physics, fractional quantum Hall effect, and high-T_c superconductors. Thermostatistics of q-bosons and q-fermions can be established using basic numbers and employing the q-calculus based on the Jackson derivative.

In 2012, Bohner and Chieochan ([1]) introduced in the literature the concept of periodicity for functions defined on quantum calculus. In this talk, our goal is to present some results concerning periodicity on quantum calculus. We will show results such as periodic averaging theorem and Massera's theorem for q-difference equations, as well as examples to illustrate our main results. These results can be found in [2, 3] and these works are joint with Martin Bohner.

Referencias

[1] M. Bohner, R. Chieochan, Floquet theory for q-difference equations. *Sarajevo J. Math.*, (2012) 8(21)(2): 1–12.
[2] M. Bohner, J. G. Mesquita, Periodic averaging principle in quantum calculus.*Journal of Mathematical Analysis and Applications (Print)*, v. 435, p. 1146-1159, 2016.
[3] M. Bohner, J. G. Mesquita, Massera's Theorem in Quantum Calculus,*Proceedings of American Mathematical Society*, 2018, no. 11, 4755–4766.

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