

Khrushchev's formula on the real line

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Abstract

Khrushchev's formula was introduced in 2001 by Sergei Khrushchev to take advantage of continued fraction methods to study Orthogonal Polynomials on the Unit Circle (OPUC).

He surprised OPUC community with new and deep results in OPUC theory which revolutionized this theory. Key for these results is the so-called Khrushchev's formula that identifies the Schur function of the orthogonality measure modified by the corresponding OPUC.

Curiously, the analogue of Khrushchev's formula for Orthogonal Polynomials on the Real Line (OPRL) was not known until 2018. It was uncovered by Grünbaum and Velázquez, who obtained the OPRL version via operator theory. This result had the drawback of being only valid for the determinate case. The new approach to OPRL Khrushchev's formula presented in this talk shows its validity for any measure. This allows us to use such a tool to obtain information about convergence properties of OPRL even in the indeterminate case.

We also present a simple diagrammatic proof of OPRL Khrushchev's formula which sheds light on its graph theoretical meaning.