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Special session of the Differential Seminar. Rounding error analysis of linear recurrences using generating series by Marc Mezzarobba, LIX, Palaiseau. 16:00-17:00. IHP, Amphitheater Hermite

jeudi 30 novembre 2023 16:00 (1 heure)

Abstract. In the computation of linearly recurrent sequences, round-off errors arising from each step tend to "cancel out" rather than just accumulate. This phenomenon is crucial to consider when aiming to establish realistic error bounds. That requires a close examination of how a given round-off error propagates through the remaining iterations of the recurrence. Doing so using traditional "sequence" notations results in intricate calculations involving nested sums. However, in other contexts, such as enumerative combinatorics, the use of generating series to encode sequences simplifies these calculations while simultaneously granting access to powerful new analytic tools. In this talk, I will show how the idea of using generating series can be adapted to the error analysis of numerical algorithms based on linear recurrence relations.