# Determining Constant Residues by Evaluation

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In symbolic integration, the residues of a simple function $f$ are exactly the roots of the Rothstein-Trager resultant of $f$ (see [3, 4] and [1, §4.4]). All the residues of $f$ are constant if and only if the monic associate of its Rothstein-Trager resultant is a univariate polynomial with constant coefficients. Based on polynomial evaluation, we present an algorithm for determining whether the residues of a simple function in a primitive monomial extension belong to the algebraic closure of the constant subfield. Experimental results illustrate that the algorithm outperforms the naive method that expands Rothstein-Trager resultants. It may help the additive decomposition algorithm ADDDECOMPINFIELD in [2] to determine elementary integrability efficiently.

This is joint work with Yiman Gao and Jing Guo.

# References

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