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Summary: Halved monotone triangles are a generalisation of vertically symmetric alternating sign matrices (VSASMs). We provide a weighted enumeration of halved monotone triangles with respect to a parameter which generalises the number of $-1$s in a VSASM. Among other things, this enables us to establish a generating function for vertically symmetric alternating sign trapezoids. Our results are mainly presented in terms of constant term expressions. For the proofs, we exploit Fischer’s method of operator formulae as a key tool.

MSC:
05A15 Exact enumeration problems, generating functions
05B20 Combinatorial aspects of matrices (incidence, Hadamard, etc.)
15B35 Sign pattern matrices

Keywords:
alternating sign matrix; alternating sign trapezoid; monotone triangle; operator formula; constant term formula; symplectic group character

Software:
ROBBINS

Full Text: DOI

References:
[3] Ayyer, Arvind; Behrend, Roger E.; Fischer, Ilse, Extreme diagonally and antidiagonally symmetric alternating sign matrices of odd order, preprint · Zbl 1436.15037

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