BORDER BASES FOR IDEALS IN THE RING OF DIFFERENCE OPERATORS RESPECTING ORTHANT DECOMPOSITIONS

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ABSTRACT. Gröbner bases are well established as one of the main tools for the algorithmic treatment of commutative algebra. However in numerical polynomial algebra border bases play a key role due to the fact that they are numerically more stable than Gröbner bases. In recent years the notion of Gröbner bases has been extended to ideals of difference operators by introducing orthant decompositions and generalized term orders. We extend the notion of border bases to ideals of difference operators such that the intrinsic connection which can be observed between Gröbner and border bases for polynomial ideals is preserved.

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