ALGEBRAIC STRUCTURES ARISING FROM ISOTONIAN MAPS BETWEEN POSETS

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Abstract

Our main goal is to study the ideal $L(P,Q)$ and toric ring $K[P,Q]$ whose generators are in bijection to the isotone maps from P to Q. We examine the several algebraic properties of $L(P,Q)$ including Alexander duality behaviour. The class of algebras $K[P,Q]$, called isotonian, are natural generalizations of the so-called Hibi rings. We determine the Krull dimension of these algebras and for particular classes of posets P and Q we discuss their normality behaviour. Also, we determine special classes of P and Q for which defining ideal of $K[P,Q]$ admits a quadratic Gröbner basis.

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