

# 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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