ALGEBRAIC STRUCTURES ARISING FROM ISOTONIAN MAPS BETWEEN POSETS

AYESHA ASLOOB QURESHI

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.

Sabanci University, Orta Mahalle, Tuzla 34956, Istanbul, Turkey
E-mail address: aqureshi@sabanciuniv.edu