ON COHOMOLOGY OF (QUASI)TORIC MANIFOLDS OVER A VERTEX CUT OF A FINITE PRODUCT OF SIMPLICES

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Quasitoric manifold was introduced by Davis and Januszkiewicz in 1991. Classification of (quasi)toric manifolds is an active topic in mathematics nowadays. Choi, Masuda, and Suh classified the quasitoric manifolds over a finite product of simplices. Hasui, Kuwata, Masuda, and Park discussed and classified toric manifolds over a vertex cut of an n-dimensional cube. By toric manifold, we mean a complete, non-singular projective toric variety. In this talk, we give the necessary and sufficient condition when a quasitoric manifold over a product of two simplices is a toric manifold. Moreover, we show that a toric manifold over a finite product of simplices satisfies this necessary condition. Then we study some combinatorial properties of (quasi)toric manifolds over a vertex cut of a finite product of simplices. We discuss their integral cohomology rings with possibly minimal generators and show several relations among the product of these generators. Further, we focus on classifying the cohomology rings up to isomorphism.