Summary: Finite generation of the symbolic Rees ring of a space monomial prime ideal of a 3-dimensional weighted polynomial ring is a very interesting problem. Negative curves play important roles in finite generation of these rings. We are interested in the structure of the negative curve. We shall prove that negative curves are rational in many cases. We also see that the Cox ring of the blow-up of a toric variety at the point $(1,1,\ldots,1)$ coincides with the extended symbolic Rees ring of an ideal of a polynomial ring. For example, Roberts’ second counterexample to Cowsik’s question (and Hilbert’s 14th problem) coincides with the Cox ring of some normal projective variety (Remark 2.7).

MSC:

13-XX Commutative algebra
14-XX Algebraic geometry

Keywords:
Cox ring; symbolic Rees ring; finite generation; Ehrhart ring; toric variety

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References:


