

Gluing and Hilbert functions of monomial curves

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In this article, by using the technique of gluing semigroups, we give infinitely many families of 1-dimensional local rings with non-decreasing Hilbert functions. More significantly, these are local rings whose associated graded rings are not necessarily Cohen-Macaulay. In this sense, we give an effective technique to construct large families of 1-dimensional Gorenstein local rings associated to monomial curves, which support Rossi's conjecture saying that every Gorenstein local ring has non-decreasing Hilbert function.

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