

1102-13-141

Sean Sather-Wagstaff* (sean.sather-wagstaff@ndsu.edu), **Benjamin Anderson**, **Anders Frankild**, **Richard Wicklein** and **Roger Wiegand**. *Two questions about Ext*. Preliminary report.

Let k be a field, and consider the localized polynomial ring $R = k[x_1, \dots, x_d]_{(x_1, \dots, x_d)}$ with $\widehat{R} = k[[x_1, \dots, x_d]]$. We consider the following two questions about $\text{Ext}_R^i(-, R)$.

Question 1. For which values of i do we have $\text{Ext}_R^i(\widehat{R}, R) \neq 0$? It is known that $\text{Ext}_R^i(\widehat{R}, R) = 0$ for $i = 0$ and for $i > d$. And it is known that $\text{Ext}_R^i(\widehat{R}, R) \neq 0$ for at least one value of i , necessarily between 1 and d . In particular, a complete answer is known for $d = 1$.

Question 2. For which prime ideals $\mathfrak{p} \subset R$ does there exist an integer i such that $\text{Ext}_R^i(\kappa(\mathfrak{p}), R) \neq 0$? It is known that the maximal ideal $\mathfrak{m} = (x_1, \dots, x_d)R$ satisfies this condition: one has $\text{Ext}_R^i(\kappa(\mathfrak{m}), R) \neq 0$ if and only if $i = d$. A complete answer is known for $d = 1$, and partial answers are known for $d > 1$. (Received July 27, 2014)