1061-13-181 **Emily E Witt*** (`emwitt@umich.edu`), University of Michigan, Department of Mathematics, 530 Church St, Ann Arbor, MI 48109. *Local cohomology with support in ideals of maximal minors.*

Suppose k is a field, and $k[X]$ is a polynomial ring over k, where $X = [x_{ij}]$ is an $r \times s$ matrix of indeterminates. Let I be the ideal generated by the maximal minors of X. Interestingly, certain local cohomology modules $H^i_I(R)$ that have been found to vanish by Peskine and Szpiro when i is strictly larger than the height of I and k has positive characteristic have been found to be nonzero when k has characteristic zero by Hochster, Bruns, and Schwänzl. However, in the characteristic zero case, very few of these modules have been computed: the calculation has seemed difficult. Using results of Lyubeznik on D-modules, as well as the invariant theory of linearly reductive groups, we will determine the structure of these local cohomology modules in the characteristic zero case, including for which i they are nonzero, what their associated primes are, complete information for $i = rs - r^2 + 1$ (the top non-vanishing one), and substantial information about the nonzero $H^i_I(R)$ for other values of i. (Received April 13, 2010)