Josep Alvarez-Montaner and Gennady Lyubeznik* (gennady@math.umn.edu), Department of Mathematics, University of Minnesota, 206 Church Street, S.E., Minneapolis, MN 55455, and Manuel Blickle. A surprising fact about \( D \)-modules in characteristic \( p > 0 \).

Let \( R = k[x_1, \ldots, x_d] \) or \( R = k[[x_1, \ldots, x_d]] \) be either a polynomial or a formal power series ring in a finite number of variables over a field \( k \) of characteristic \( p > 0 \) and let \( D \) be the ring of \( k \)-linear differential operators of \( R \). In this paper we prove that if \( f \) is a non-zero element of \( R \) then \( R_f \), obtained from \( R \) by inverting \( f \), is generated as a \( D \)-module by \( \frac{1}{f} \).

This is an amazing fact considering that the corresponding characteristic zero statement is very false. In fact we prove an analog of this result for a considerably wider class of rings \( R \) and a considerably wider class of \( D \)-modules. (Received September 29, 2004)