1023-14-942 **Darren Salven Tapp*** (dtapp@math.purdue.edu), Department of Mathematics, Purdue University, 150 N. University Street, West Lafayette, IN 47907-2067. *Bernstein Sato polynomial in low dimension.*

We will discuss the Bernstein–Sato polynomial $b_f(s)$ of a homogeneous form in two variables. The Bernstein–Sato polynomial of any singularity $(f = 0)$ is closely related to various important invariants attached to f.

Our method uses De Rham cohomology H of the Milnor fiber in the context of D-modules. In this context we give an algorithm to calculate the dimensions of certain parts of H. Nonvanishing of such dimensions implies the existence of certain roots of the Bernstein–Sato polynomial. We then present an algorithm to compute a new bound for $b_f(s)$. In the process we calculate the jumping coefficients for the multiplier ideals of the singularities in question.

We will outline how these ideas allow us to determine all the roots of the Bernstein–Sato polynomial in many cases and discuss generalizations to higher dimensional problems. This material will form part of my thesis. (Received September 23, 2006)