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The determinant of the Gauss-Manin connection

In the talk, I will try to present some aspects of how to compute the determinant of the Gauss-Manin connection, following the work I have been developing jointly with Spencer Bloch, and lately with Spencer Bloch and Alexander Beilinson.

The Gauss-Manin connection codes how the cohomology of differential equations, for example on the z -affine line of the type $d(a(t)z^2+b(t)z)$, moves with the parameter t , just as the cohomology of the Artin-Schreier covering $y^p - y = az^2 + bz$ of the affine z -line is acted on by the Frobenius of the finite field of characteristic p containing the parameters a, b .