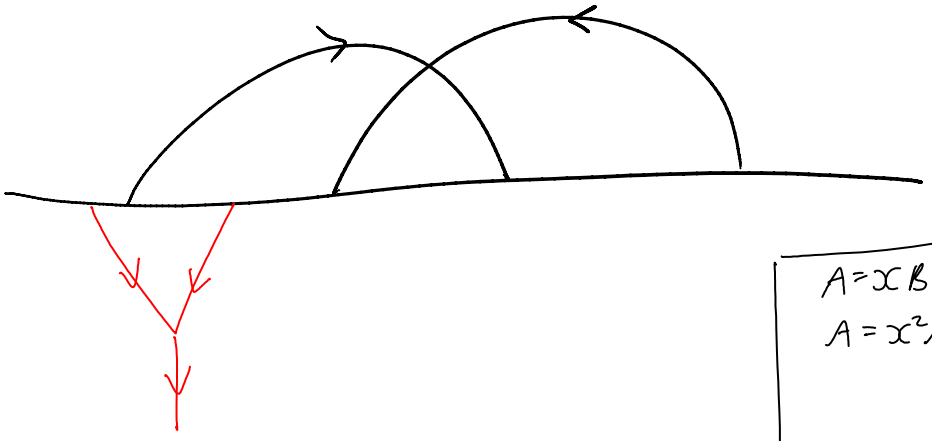
The Infinitesimal Alexander Module

June-20-09
6:15 AM

It's time to complete 2008-09\AlexanderEulerSpaces.nb!
(now at 2009-06/InfinitesimalAlexanderModules.nb)



$A = xB$, $B = xA \Rightarrow$
$A = x^2 A$, $(1-x^2)A = 0$

$e^{ada}(b) = e^a b e^{-a}$

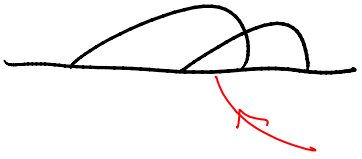
$e^a b - b e^a = (e^{ada} - 1)(b) \cdot e^a$

$\frac{e^{ada} - 1}{ad\,a}[a,b] = (e^{ada} - 1)b = e^a b e^{-a} - b \qquad / e^a$

Questions 1. Is this equivalent to the Alexander module?

2. Is there a structure theory for $\mathbb{Q}[[x]]$ modules? Can we get invariants out of this one?

Speculation To understand the Alexander polynomial I will also have to understand "the other infi. Alexander module", its "tensor product" or somehow "fusion" with the ordinary infi. Alexander module, the canonical element in that fusion, and the extension by "wheels".



Speculation In some sense there is a bundle

Speculation In some sense there is a bundle of Alexander modules parametrized by the knot itself, along with a connection. The Alexander polynomial is the Jacobian of the holonomy of that connection. or trace