

MATHEMATICAL SCIENCES RESEARCH INSTITUTE

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Dear Joan,

Thanks to some considerable help from the

Kazhdan-Lusztig paper (which is terribly relevant to the whole business) I managed to put together the representation of B_6 which passes to mapping class gp. of sphere - 6 points in a nice form for calculation. You'll recognize lots of Burau rep. everywhere - this is as it should be.

up to powers of t

So to calculate the trace polynomial (one variable) for a ~~closed~~ 6-plat, just look at the ~~product~~ of the braid word in ~~these generators~~ this representation and evaluate $e_1 e_3 e_5 \alpha e_1 e_3 e_5$. Note that

$$(\alpha e_3 \alpha e_1 e_3)$$

$e_1 e_3 e_5$ is the matrix

$$\begin{pmatrix} 0 & 0 & \frac{t}{(1+t)^2} & 0 & 0 \\ 0 & 0 & \frac{1}{1+t} & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & \frac{1}{1+t} & 0 & 0 \\ 0 & 0 & \frac{1}{1+t} & 0 & 0 \end{pmatrix}$$

so this part is trivial.

In fact getting rid of the $\sqrt{t}$'s seems interesting - it's not clear that Kazhdan & Lusztig know this sort of thing.

Putting $t = -1$ is interesting the Lie algebra generated

by $1+g_1, \dots, 1+g_5$ when $t=-1$ should be
north looking at.

Have fun with the matrices - this is as good
as they can be.

All the best,

Vaughan