c]

$$u_i w \otimes v_i = x_i \otimes y_i \qquad \text{central}$$

suppose $\rho \ni \begin{cases} u_i w\, \rho(v_i) = 1 \\ \rho(u_i w)\, v_i = 1. \end{cases} \Rightarrow u_i \rho(v_i) = w^{-1}$

$$tr(u_i v_j) = \delta_{ij}$$

$$\rho(a) = tr(w^{-1} a)$$

Find assertion. Let $\tau$ be canonical trace.

Then any $\rho$ have form $\rho(a) = \tau(w a)$ some $w \in A$.

Take $u_i z \otimes v_i = u_i \otimes z v_i$ for $x_i \otimes y_i$

$$\rho(u_i z) v_i = \rho(u_i) z v_i = 1$$

$$u_i z \rho(v_i) = u_i \rho(z v_i) = 1$$

$$u_i z \tau(w v_i) = \underbrace{u_i \tau(w z v_i) = 1}$$

$$\tau(v_j u_i) \tau(w z v_i) = \tau(v_j)$$

$$\overset{\shortparallel}{\delta_{ji}} \qquad wz = 1. \qquad w = z^{-1}$$

A) Define the $p'$ evaluations.

B) prove that the evaluations are faithfull (i.e. if $\alpha$ is "captured" by a row evaluation it is also captured by a collumn evaluation).

C) (perhaps) we have to prove we can keep the system symmetrical after the changes. Perhaps this is a purely cosmetic requirement.

(5) Consider "restricted" conditions which are almost constant i.e. $j$ is mapped $j' \in \{j, j+1, \ldots, j+p\}$. It is possible to arrange "critical" branes (i.e. branes which form a restricted condition) such that nodes with root in $D$ appears before root in $R$. Further more we can ensure that allong a branch the first $k_1$ places are rooted in $D$ while the last $k - k_1$ are rooted in $R$. This ensures we can define a weight-function which behaves properly.

d

Conclusion is that if $\omega \in A^\times$, then can take $x_i \otimes y_i = u_i \omega \otimes v_i$

and $\rho(a) = \tau(\omega^{-1} a)$.

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March 10. Go over Joachim's remarks about P.

$$T(a) \longrightarrow R\tilde{a} = \Omega^{ev}(\tilde{a})$$

Two possibilities ~~$a_0 da_1$~~

$$(a_0, \ldots, a_{2n}) \longmapsto a_0 da_1 \cdots da_{2n}$$
$$(a_1, \ldots, a_{2n}) \longmapsto da_1 \cdots da_n$$

defines $e_{2n} : T(a) \longrightarrow \Omega^{2n} \tilde{a}$

Then ~~what~~ P is supposed to be $e_{2n} P_\lambda e_{2n}$

Other possibility is to map

$$a_0, \ldots, a_{2n} \longmapsto a_0 \circ \cdots \circ a_{2n}$$

So what was he saying?

$$X(R\tilde{a}) = \Omega(a)$$
$$\|$$
$$X(T(a))$$

---

$$\subset \mathbb{C} \subset \rho(A) \subset \rho(A)^2 \subset \rho(A)^3 \subset$$

RA IA $IA^2$

$$a_0 \circ a_1 \circ a_2 = a_0 \circ (a_1 a_2 - da_1 da_2)$$
$$= a_0 a_1 a_2 - a_0 da_1 da_2 - da_0 da_1 a_2 - da_0 a_1 da_2$$
$$a_1 \circ a_2 = a_1 a_2 - da_1 da_2$$

e

$$e_2(a_0, a_1, a_2) = -a_0\, da_1\, da_2 - da_0\, a_1\, da_2 - da_0\, da_1\, a_2$$

$$e_2(a_1, a_2) = -da_1\, da_2.$$

---

$$a_0 \circ a_1 \circ a_2 \circ a_3 = (a_0 a_1 - da_0 da_1) \circ (a_2 a_3 - da_2 da_3)$$

$$= a_0 a_1 a_2 a_3 - d(a_0 a_1)\, d(a_2 a_3)$$

$$- a_0 a_1 da_2 da_3 - da_0 da_1 a_2 a_3 + da_0 da_1 da_2 da_3$$

---

$$b'(a_0 da_1 \cdots da_n) = (-1)^{n-1} a_0 da_1 \cdots da_{n-1} a_n$$

$$= \sum_{i=1}^{n-1} (-1)^{-i} a_0 \cdots d(a_i a_{i+1}) \cdots$$

$$+ a_0 a_1 da_2 \cdots da_n$$

$$\Longleftrightarrow b'(a_0, \dots, a_n)$$

If $a_0 = 1$. get $\sum_{i=1}^{n} (-1)^i da_1 \cdots d(a_i a_{i+1}) \cdots da_n$

$$+ a_1 da_2 \cdots da_n$$

Thus $$\left[ \begin{pmatrix} b' & 1 \\ & -b' \end{pmatrix}, \begin{pmatrix} 0 & 0 \\ 1 & 0 \end{pmatrix} \right] = \begin{pmatrix} 1 & 0 \\ -b' + b' & 1 \end{pmatrix}$$

So lifting is $$P \begin{pmatrix} b' & 1 \\ \cancel{b} & -b' \end{pmatrix} \begin{pmatrix} 0 \\ P_\lambda \end{pmatrix}$$

$$= \begin{pmatrix} P_\lambda & 0 \\ b'G_\lambda - G_\lambda b & P_\lambda \end{pmatrix} \begin{pmatrix} P_\lambda \\ -b' P_\lambda \end{pmatrix} = \begin{pmatrix} P_\lambda \\ -G_\lambda b P_\lambda - P_\lambda b' P_\lambda \end{pmatrix}$$

$$0 \longrightarrow \underset{-b'}{P_\lambda C^\bullet[1]} \xrightarrow{\binom{0}{1}} P\bar{\Omega}\tilde{A} \xrightarrow{(N_\lambda\ 0)} \underset{b'}{P_\lambda C^\bullet} \longrightarrow 0$$

I've been sloppy about the N, but ~~it makes~~

$$b'(P_\lambda b' P_\lambda) = b'^2 P_\lambda = 0 \qquad (P_\lambda b' P_\lambda)\, b'(P_\lambda \alpha)$$

k] Cuntz excision in periodic cyclic homology

Review what we know already.

$$\begin{tikzcd}
 & & & J \arrow[d] & \\
0 \arrow[r] & I \arrow[r] \arrow[d] & TA \arrow[r] & A \arrow[r] \arrow[d] & 0 \\
0 \arrow[r] & K \arrow[r] \arrow[d] & TA \arrow[r] & B \arrow[r] & 0 \\
 & J & & &
\end{tikzcd}$$

$$I^\infty = \{I^k\}.$$

Before he established that excision in cyclic cohomology holds for

$$J^\infty \longrightarrow R \longrightarrow R/J^\infty \qquad \text{nonunital}$$

provided we can find suitable $J^n \longrightarrow J \otimes J$ left $J$-linear lifting of mult.

$$\begin{tikzcd}
 & J \otimes J \arrow[d] \\
J^2 \arrow[ur, dashed, "\substack{J\text{-module} \\ \text{map } \varphi}"] \arrow[r] & J^2
\end{tikzcd}$$

Then $J^{n+2} \longrightarrow J^{n+1} \otimes J$ for all $n$.

Better $J^n \longrightarrow J^{n-1} \otimes J \longrightarrow (J^{n-2} \otimes J) \otimes J$

t excision in per cyc coh.

$$0 \longrightarrow J \longrightarrow A \longrightarrow B \longrightarrow 0$$

$$\begin{array}{ccccccc} \longleftarrow & HP(A,J) & \longleftarrow & HP(A) & \longleftarrow & HP(B) \\ & \downarrow & & & & \\ & HP(J) & & & & \end{array}$$

to ~~assertion~~ prove that map $HP(A,J) \longrightarrow HP(J)$ is isom.

Assume that $HP(TA, IA) \xrightarrow{\sim} HP(IA)$ for all A.

Then this should be enough.

---

Shift to covariant functors. F

Given $0 \to J \to A \to B \to 0$ get

$$\begin{array}{ccccccc} \longrightarrow & F(A,J) & \longrightarrow & F(A) & \longrightarrow & F(B) & \longrightarrow \\ & \uparrow & & & & & \\ & F(J) & & & & & \end{array}$$

Suppose we know $F(IA) \xrightarrow{\sim} F(TA, IA)$ for all A.

$$\begin{array}{ccccccccc} & & 0 & & & & & & \\ & & \updownarrow & & & & & & \\ 0 & \longrightarrow & J & \longrightarrow & A & \longrightarrow & B & \longrightarrow & 0 \\ & & \uparrow & & \uparrow & & \| & & \\ 0 & \longrightarrow & K & \longrightarrow & TA & \longrightarrow & B & \longrightarrow & 0 \\ & & \uparrow & & \uparrow & & & & \\ & & IA & = & IA & & & & \end{array}$$

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So apparently we define on $Q\tilde{A}$ a derivation.

Should one do stable multipliers, i.e. multipliers for $M_n a$? Read Wodzicki about Vaserstein lemma