ralph kaufmann <kaufmann.ralph@gmail.com>

Spineless cacti

ralph kaufmann <rkaufman@math.purdue.edu> Fri, Mar 21, 2008 at 7:59 PM
To: Paolo Salvatore <salvator@axp.mat.uniroma2.it>

Dear Paolo,

you are right. If one adds C(0) then the operad will only be a quasi-operad.
On the cellular chain level everything will be fine though.
Now if one wants to rectify the situation on the topological level, one has to work a little harder.
The idea is as you say to add degeneracies. In terms of foliations this can be done using gaps in the foliation.
I just posted a revised version of my dimension vs genus paper on the arxiv which does this. I thanked you for comments,
since you raised the issue. For the cacti, this means that one changes the parameterization of the outside loop.
Instead of going counterclockwise around the cactus (basically at constant speed) one is allowed
to make stops. Now when forgetting a lobe this puts in the stops that last as long as it took to go around
the now contracted pieces of that lobe. This makes everything associative on the nose.
It was hard for me to cut through the paper of Jim and Jeff, even with Jim's hellp, but probably the two constructions coincide after using the map I put in the paper above.

Thanks again for the comment.

Best,
Ralph

On Thu, Feb 28, 2008 at 6:44 PM, Paolo Salvatore <salvator@axp.mat.uniroma2.it> wrote:

> Dear Ralph,
> I hope that all is well.
> I am looking at your spineless cacti operad. I agree with you that
> its positive part Cact(n) (n>0) is equivalent to the positive part of the
> little 2-discs operad. However I do not see a way of extending this to
> an equivalence of E_2-operads. If you declare that C(0) is
> a base point *, and composition by * kills off lobes, then composition is
> not associative.
> Take x= cactus with two lobes of equal length.
> Then (x \circ_1 x) \circ_1 * is not x \circ_1 (x \circ_1 *)=x
> A way of getting around the problem is to add some degenerate cacti,
> that is exactly what McClure and Smith did.
> Thanks for any comments that you might have on this.
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> Best regards,
>
> Paolo

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