

MF Workshop: PROBLEM SESSION (Bielefeld 5-25/11)

(1/5)

• Lenzing: "Comments on Orlov's Thm": Proper scope of Orlov's thm

- includes non-comm. Gorenstein setting, but $\text{coh } X$??
What are the specific properties of $\text{coh } X$ in this more general setting? \swarrow (via Serre constr.)
- Which type of grading is allowed?
classical Orlov: \mathbb{Z} Lenzing's case: \mathbb{L} -gradings
heard today: $\mathbb{Z} \oplus (\text{fin})$ \rightsquigarrow \mathbb{Z}^n -case??

Also: positive grading needed?

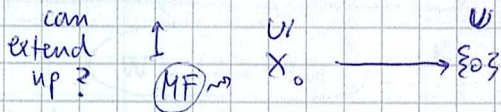
- Interpretation of Gorenstein parameter (in above cases) in terms of
 - 1) other invariants
 - 2) actual calculations
- Extension from ab. gp. case to G -equivariant case, for G reductive?
- \exists tilting object in $D^b \text{coh } X$, $\text{Sing}^{\text{ft}} A$? cluster tilting?

• Buchweitz: "A couple of pts left over from last year, reinforced during this workshop."

- Intrinsic def. of Hochschild (co-)homology for a triangulated cat.?
(without enhancement / Toën machinery)
- related: Reconstruction theorems?
Given 2 sing. cats \rightsquigarrow can reconstruct whether isom. sing.?
 - When possible?
 - How much enhancement do we actually need?
- Intersection theory in $D_{\text{sq}}(A) \cong D^b(\text{coh } X)$
(If so: here have \otimes -prod. but)
 \rightsquigarrow monoidal structure under Orlov's thm?
(i.e.: how/when compatible ...)

- Deformations / things of MFs ?

e.g: $(f=0) = X_0$ on MF: $f: (\mathbb{C}^{n+1}, 0) \rightarrow (\mathbb{C}, 0)$



$f + \sum a_i g_i = 0$

some unfolding?

What if M is of Koszul type?

NO IDEA!

• Hanno Becker:

question: $\text{HMF}(S, w) \times \text{HMF}(S, w') \xrightarrow{\otimes} \text{HMF}(S, w+w')$

$\text{MCM}(S, w) \times \text{MCM}(S, w') \xrightarrow{\quad} \text{MCM}(S, w+w')$

know how to compute $M \otimes N$ here ...

when compatible with stabilization?

How does \otimes -prod look like here?

i.e.: $(\text{stab}_w M) \otimes (\text{stab}_{w'} N) \xrightarrow{\cong?} \text{stab}_{w+w'}(M \otimes N)$

• Dan Murfet: Recall: I was categorifying link invariants ...

e.g: $\underbrace{\text{link}}_m \rightsquigarrow \mathbb{K}^b(\text{limf}(\mathbb{Q}[x_1, x_2], x_1^{N+1} + x_2^{N+1}))$

e.g: σ_1^m

\cong functor F_m

have bicategory of LG-models: obj $\equiv (k[x], W)$

morph. $\equiv \text{Hom}((k[x], W), (k[y], V))$

$\mathbb{K}^b(\text{limf}(V-W))$

(properties of such cat?) \rightarrow

Thus, to a braid (eg σ) we attach an autom. of $(\mathbb{Q}[x], x^{N+1})^{\otimes 2}$

Questions:

- Khovanov-Bozman's do: $B_m \xrightarrow{KR} \text{Aut}((\mathbb{Q}[x], x^{N+1})^{\otimes m})$
braid g

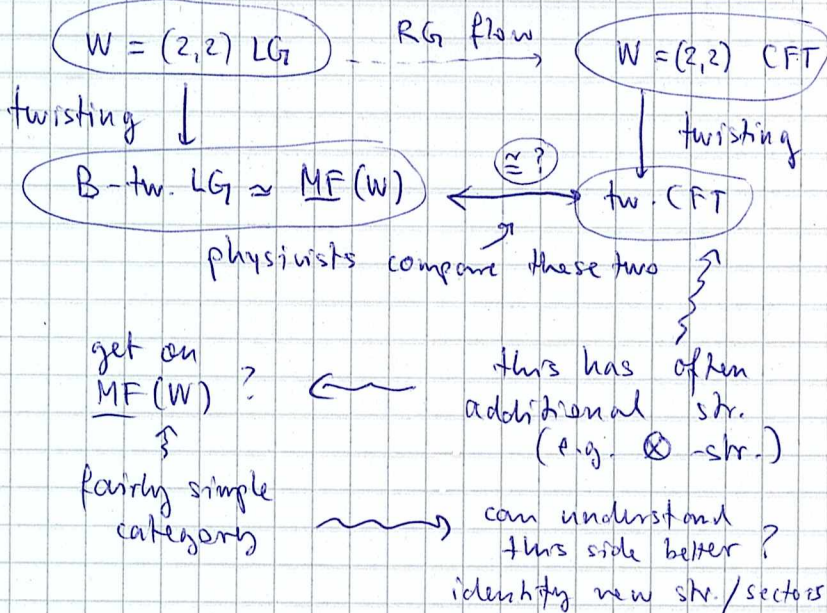
For which W does $(k[x], W)^{\otimes m}$ carry a repr. of B_m ?
what is the extent of this??

Know: branching in LG bricat, \exists for some D type $xy^2 + x^{2n+1}$

$\exists?$ more simple/general approach?

- Does anyone understand ^{five branes} ~~Five branes~~ & knots? (line links to fancy physics ...)

• Nils Carqueville - CFT/LG

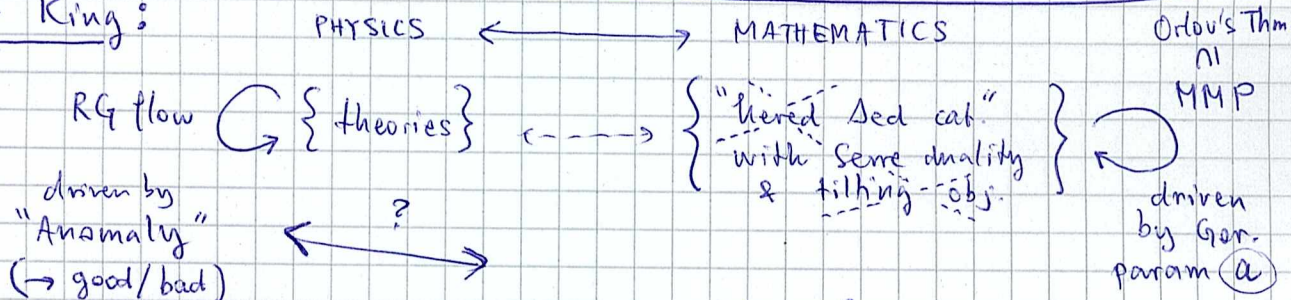


also:

Renormalization gr-flow: must understand better!

- (Jesse:) can physics say anything about complete intersections?

• Alistair King:



Q: can take "hereditary" and "tilting object" out of the equation? (for the MMP)

W ample \rightarrow $a \geq 0$ = good
 $a \leq 0$ = bad
 $\Delta \rightarrow$ (or vice-versa)
 (MMP = minimal model program)

The End