

To complete the preprint titled "An affirmative answer to a conjecture for Metoki class by Kentaro Mikami at Akita University", we asked help of Groebner Basis Package of Maple, which is one of Symbol Calculus Softwares, in order to get bases of given cochain complexes and the cohomology groups.

In this note, we make use of Risa/Asir, which is another Symbol Calculus Software, and show the results we got by Maple and Risa/Asir are the same up to non-zero scalar multiples.

We remark that we added some line breaks so that we get better look.

Basis of $d_0(C_{GF}^8(\mathfrak{ham}_2, \mathfrak{sp}(2, \mathbb{R}))_{14}) \subset C_{GF}^9(\mathfrak{ham}_2, \mathfrak{sp}(2, \mathbb{R}))_{14}$:

Our source file for Risa/Asir is this:

```
/* On C^{8} -> C^{9}
output("exact_t0_wt14_8and9.txt")$ */
YList = base_var_list(y, 1, 113)$
load("Mat_14_8and9_type0.rr")$
FList = [F1, F2, F3, F4, F5, F6, F7, F8, F9, F10, F11, F12, F13, F14, F15, F16,
F17, F18, F19, F20, F21, F22, F23, F24, F25, F26, F27, F28, F29, F30, F31, F32,
F33, F34, F35, F36, F37, F38, F39, F40, F41, F42, F43, F44, F45, F46, F47, F48,
F49, F50, F51, F52, F53, F54, F55, F56, F57, F58, F59, F60, F61, F62, F63, F64,
F65, F66, F67, F68, F69, F70, F71, F72, F73, F74, F75, F76, F77, F78, F79, F80,
F81, F82, F83, F84, F85, F86, F87, F88, F89, F90, F91, F92, F93, F94, F95, F96,
F97, F98, F99, F100, F101, F102, F103, F104, F105, F106, F107, F108, F109, F110,
F111, F112, F113, F114, F115, F116, F117, F118, F119, F120, F121, F122, F123,
F124, F125, F126, F127, F128, F129, F130, F131, F132, F133, F134, F135, F136,
F137, F138, F139, F140, F141, F142, F143, F144, F145, F146, F147, F148, F149,
F150, F151, F152, F153, F154, F155, F156, F157, F158, F159, F160, F161, F162,
F163, F164, F165, F166, F167, F168, F169, F170, F171, F172, F173, F174, F175,
F176, F177, F178, F179, F180, F181, F182, F183, F184, F185, F186, F187, F188,
F189, F190, F191, F192, F193, F194, F195, F196, F197, F198, F199, F200, F201,
F202, F203, F204, F205, F206, F207, F208, F209, F210, F211, F212, F213, F214,
F215, F216, F217, F218, F219, F220, F221, F222, F223, F224, F225, F226, F227,
F228, F229, F230, F231, F232]$

ord( YList ) $      GB1 = nd_gr(FList, YList ,0,0) $
GB1 = reverse(GB1); print(["GBe",GB1])$
output()$          end$
```

A part of the output of Groebner Basis is: —

```
GBe = [5*y103-2*y104+y105+5*y106+y107-8*y108+4*y109-y111-14*y112-420*y113,
15*y96+10*y97-10*y99-10*y100-y104-2*y105-10*y106-2*y107+16*y108-8*y109
+2*y111+28*y112+1540*y113,
20*y89+24*y90-24*y91+24*y92-30*y93-8*y94-80*y95-15*y105+18*y107-18*y108+24*y109
-60*y110-224*y112,
84 more terms
]$
```

Morita conjecture for Kontsevich map $\omega \wedge : \mathbf{H}_{\text{GF}}^7(\mathfrak{ham}_2^0, \mathfrak{sp}(2, \mathbb{R}))_{16} \rightarrow \mathbf{H}_{\text{GF}}^9(\mathfrak{ham}_2, \mathfrak{sp}(2, \mathbb{R}))_{14}$:

We have h in $\mathbf{H}_{\text{GF}}^7(\mathfrak{ham}_2^0, \mathfrak{sp}(2, \mathbb{R}))_{16}$ and $\bar{h} = \omega \wedge h$ is given by

```
/* This is a data of \omega \wedge h(w) in C^{9}_{wt=14} */
Hbar = -6996191251500*y74-1557312364575*y76+2027141067600*y77+6871115344500*y78
-8293793595120*y79+1593871052400*y80+3342315930030*y81+3576568317699*y82
-1206881491512*y83-3952406350359*y84-21353158325775*y85-21096249215580*y86
-9572836551300*y87+3867959161440*y88+10699190322480*y89-23511502274085*y90
+2799062316375*y91+17460883387175*y92+17517045194250*y93-43245161055925*y94
-121841132599900*y95$
```

Our source file for Risa/Asir is this:

```
/*
Final stage of checking hbar is in GBe or not at C^{9}_{wt=14}.
*/

output("kekka_t0_wt14_9and9.txt")$
load("exact_t0_wt14_8and9.txt")$ /* GBe */
YList = base_var_list(y, 1, 113)$

Hbar = -6996191251500*y74-1557312364575*y76+2027141067600*y77
+6871115344500*y78-8293793595120*y79+1593871052400*y80+3342315930030*y81
+3576568317699*y82-1206881491512*y83-3952406350359*y84-21353158325775*y85
-21096249215580*y86-9572836551300*y87+3867959161440*y88+10699190322480*y89
-23511502274085*y90+2799062316375*y91+17460883387175*y92+17517045194250*y93
-43245161055925*y94-121841132599900*y95$

ord(YList)$      Atai = p_nf(Hbar, GBe, YList, 0) ;
output()$        end$
```

The output is:

```
5337006161133135636*y82+7838657811148122*y83-1988779467514152096*y84
-6270926248918497600*y85-66751770303219936060*y90+29003033901248051400*y91
-22179668911353400440*y92+17832946520361977550*y93+39174625584761685900*y94
+144436601905893609900*y95+846239101126376542200*y112+2538717303379129626600*y113
```

Remark: The output just above, we denote by A_{asir} . We denote by B_{maple} the output in the preprint *An affirmative answer to a conjecture for Metoki class* by K. Mikami.

You will verify that

$$B_{\text{maple}} = -\frac{1}{1191} \cdot \frac{7443523237284708}{5337006161133135636} A_{\text{asir}}$$