

Pensieve header: Fixing many many signs for SnG.

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SetDirectory["C:\\drorbn\\AcademicPensieve\\2016-03"];
<< SnG.m

tmhts[u_] :=
  (u // tm[1, 2, 1] // hts[4, 1]) - (u // hts[4, 1] // hts[4, 2] // tm[1, 2, 1]);
tmhts@UU[a[f2[b1, b2, b3], 1, 4]]
UU[0]

e7 = e8 e13;

tmhts[u_] :=
  (u // tm[1, 2, 1] // hts[4, 1]) - (u // hts[4, 1] // hts[4, 2] // tm[1, 2, 1]);
tmhts@UU[a[f6[b1, b2, b3], 2, 4]]
UU[δβ[-b1 e8 e11 f6^(1,0,0)[b1, b1, b3] + b1 e8 e13 f6^(1,0,0)[b1, b1, b3]]]

e13 = e11;

hmhts[u_] :=
  (u // hm[1, 2, 1] // hts[1, 4]) - (u // hts[2, 4] // hts[1, 4] // hm[1, 2, 1]);
hmhts@UU[ca[f24[b4, b5], 2, 4, 1]]
UU[δβ[b4 e8 e10 f24[b4, b5] - b4 e8 e12 f24[b4, b5]]]

e12 = e10;

hmhts[u_] :=
  (u // hm[2, 1, 1] // hts[1, 4]) - (u // hts[1, 4] // hts[2, 4] // hm[2, 1, 1]);
hmhts@UU[δaa[f43[b4, b5], 4, 1, 5, 2]]
UU[0]

e16 = -e2 e8;

tbAS[u_, v_] := tb[0][u, v] + tb[0][v, u];
tbAS@@{UU[a[f2[b0, b1], 0, 1]], UU[a[g2[b0, b2], 0, 3]]}
UU[0]

e41 = e40;

tbAS[u_, v_] := tb[0][u, v] + tb[0][v, u];
tbAS@@{UU[a[f2[b0, b1], 0, 1]], UU[a[g6[b0, b2], 2, 3]]}
UU[0]

e42 = e40;

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hbJacobi[u_, v_, w_] :=
  hb[0][u, hb[0][v, w]] + hb[0][v, hb[0][w, u]] + hb[0][w, hb[0][u, v]];
hbJacobi @@ {UU[a[f2[b1, b2], 1, 0]], UU[a[g2[b3, b4], 3, 0]], UU[delta[h3[b5, b6], 5, 0]]}
UU[0]

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$\epsilon_{20} = \epsilon_{18};$

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hbJacobi[u_, v_, w_] :=
  hb[0][u, hb[0][v, w]] + hb[0][v, hb[0][w, u]] + hb[0][w, hb[0][u, v]];
hbJacobi @@ {UU[a[f2[b1, b2], 1, 0]], UU[a[g2[b3, b4], 3, 0]], UU[c[h11[b5, b6], 0]]}
UU[0]

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$\epsilon_{18} = \epsilon_{19} \epsilon_{48};$

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hbJacobi[u_, v_, w_] :=
  hb[0][u, hb[0][v, w]] + hb[0][v, hb[0][w, u]] + hb[0][w, hb[0][u, v]];
hbJacobi @@ {UU[a[f2[b1, b2], 1, 0]], UU[a[g2[b3, b4], 3, 0]],
  UU[ca[h13[b5, b6], 0, 5, 0]]}
UU[0]

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$\epsilon_{22} = \epsilon_{19} \epsilon_{48};$

$\epsilon_{24} = \epsilon_{19} \epsilon_{48};$

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hbJacobi[u_, v_, w_] :=
  hb[0][u, hb[0][v, w]] + hb[0][v, hb[0][w, u]] + hb[0][w, hb[0][u, v]];
hbJacobi @@ {UU[deltaaa[f28[b1, b2], 2, 0, 2, 1]],
  UU[a[g6[b3, b4], 4, 0]], UU[a[h6[b5, b6], 6, 0]]}
UU[0]

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$\epsilon_{21} = \epsilon_{19};$

$\epsilon_{48} = \epsilon_4;$

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hbJacobi[u_, v_, w_] :=
  hb[0][u, hb[0][v, w]] + hb[0][v, hb[0][w, u]] + hb[0][w, hb[0][u, v]];
hbJacobi @@ {UU[a[f2[b1, b2], 1, 0]], UU[a[g2[b3, b4], 3, 0]],
  UU[ca[h13[b5, b6], 0, 5, 0]]}
UU[0]

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$\epsilon_{23} = \epsilon_4 \epsilon_{19};$

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thhJacobi[u_, v_, w_] := Plus[
  -thb[0, 0][u, hb[0][v, w]] + hb[0][thb[0, 0][u, v], w] + thb[0, 0][thb[0, 0][u, v],
    w] + hb[0][v, thb[0, 0][u, w]] - thb[0, 0][thb[0, 0][u, w], v]
];
thhJacobi@@{UU[a[f2[b0, b1], 0, 1]], UU[a[g2[b2, b3], 2, 0]], UU[a[h2[b4, b5], 4, 0]]}
UU[0]

e37 = e25;

e25 = e4 e19;

e26 = e4 e44;

e36 = e4 e19;

e46 = e45;

thhJacobi[u_, v_, w_] := Plus[
  -thb[0, 0][u, hb[0][v, w]] + hb[0][thb[0, 0][u, v], w] + thb[0, 0][thb[0, 0][u, v],
    w] + hb[0][v, thb[0, 0][u, w]] - thb[0, 0][thb[0, 0][u, w], v]
];
thhJacobi@@
{UU[deltaaa[f23[b0, b1], 0, 2, 0, 2]], UU[a[g6[b2, b3], 3, 0]], UU[a[h6[b4, b5], 5, 0]]}
UU[
  deltaaa[b0 b3 e4^2 e19^2 f23[b0, b1] g6[b2, b3] h6[b4, b5] - b0 b3 e38^2 f23[b0, b1] g6[b2, b3] h6[b4, b5],
    0, 2, 5, 2] + deltaaa[-b0 b5 e4^2 e19^2 f23[b0, b1] g6[b2, b3] h6[b4, b5] +
    b0 b5 e38^2 f23[b0, b1] g6[b2, b3] h6[b4, b5], 0, 2, 3, 2]]

e35 = e4 e19;

thhJacobi[u_, v_, w_] := Plus[
  -thb[0, 0][u, hb[0][v, w]] + hb[0][thb[0, 0][u, v], w] + thb[0, 0][thb[0, 0][u, v],
    w] + hb[0][v, thb[0, 0][u, w]] - thb[0, 0][thb[0, 0][u, w], v]
];
thhJacobi@@{UU[a[f2[b0, b1], 0, 1]], UU[a[g2[b2, b3], 2, 0]], UU[c[h11[b4, b5], 0]]}
UU[0]

e28 = e4 e27;

thhJacobi[u_, v_, w_] := Plus[
  -thb[0, 0][u, hb[0][v, w]] + hb[0][thb[0, 0][u, v], w] + thb[0, 0][thb[0, 0][u, v],
    w] + hb[0][v, thb[0, 0][u, w]] - thb[0, 0][thb[0, 0][u, w], v]
];
thhJacobi@@
{UU[a[f2[b0, b1], 0, 1]], UU[a[g2[b2, b3], 2, 0]], UU[ca[h13[b4, b5], 0, 4, 0]]}
UU[0]

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 $\epsilon_{33} = \epsilon_{30};$ 

 $\epsilon_{32} = \epsilon_4 \epsilon_{29};$ 

 $\epsilon_{34} = \epsilon_4 \epsilon_{31};$ 

thhJacobi[u_, v_, w_] := Plus[
  -thb[0, 0][u, hb[0][v, w]] + hb[0][thb[0, 0][u, v], w] + thb[0, 0][thb[0, 0][u, v],
    w] + hb[0][v, thb[0, 0][u, w]] - thb[0, 0][thb[0, 0][u, w], v]
];
thhJacobi@@
{UU[a[f2[b0, b1], 0, 1]], UU[a[g2[b2, b3], 2, 0]], UU[ $\delta_{aa}$ [h21[b4, b5], 4, 0, 4, 0]]}
UU[0]

 $\epsilon_{30} = \epsilon_4 \epsilon_{29};$ 

 $\epsilon_{31} = \epsilon_2 \epsilon_{27};$ 

tthJacobi[u_, v_, w_] := Plus[
  -thb[0, 0][tb[0][u, v], w] + tb[0][thb[0, 0][u, w], v] - thb[0, 0][v,
    thb[0, 0][u, w]] + tb[0][u, thb[0, 0][v, w]] + thb[0, 0][u, thb[0, 0][v, w]]
];
tthJacobi@@{UU[a[f2[b0, b1], 0, 1]], UU[a[g2[b0, b2], 0, 3]], UU[a[h2[b3, b4], 3, 0]]}
UU[0]

 $\epsilon_{17} = \epsilon_4 \epsilon_{40};$ 

 $\epsilon_{44} = \epsilon_{19} \epsilon_{40} / \epsilon_{29};$ 

 $\epsilon_{38} = \epsilon_4 \epsilon_{19};$ 

dbAS[u_, v_] := db[0][u, v] + db[0][v, u];
dbAS@@{UU[a[f2[b0, b1, b2], 0, 0]], UU[a[g2[b0, b3, b4], 0, 0]]}
UU[0]

 $\epsilon_{40} = \epsilon_{11} \epsilon_{19} / \epsilon_{10};$ 

dbJacobi[u_, v_, w_] :=
  db[0][u, db[0][v, w]] + db[0][v, db[0][w, u]] + db[0][w, db[0][u, v]];
dbJacobi@@{UU[a[f2[b0, b1, b2], 0, 0]], UU[a[g4[b0, b3, b4], 0, 3]],
  UU[a[h8[b0, b5, b6], 5, 0]]}
UU[0]

 $\epsilon_{29} = \epsilon_{19};$ 

 $\epsilon_{27} = \epsilon_{19};$ 

 $\epsilon_{45} = \epsilon_2 \epsilon_{11} \epsilon_{19} / \epsilon_{10};$ 

 $\epsilon_2 = \epsilon_4 \epsilon_{10};$ 

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ε47 = ε4 ε11 ε19;

dbdm[u_, v_] := Plus[
  db[1][u, dσ[2, -2][v]] // dm[2, -2, 2],
  -db[1][u, dσ[2, -2][v]] // dm[-2, 2, 2],
  -db[2][u, dσ[1, -1][v]] // dm[1, -1, 1],
  db[2][u, dσ[1, -1][v]] // dm[-1, 1, 1]
];
dbdm@@{UU[a[f2[b1, b2, b3], 1, 1]], UU[a[g4[b1, b2, b4], 1, 2]]}
UU[0]

ε19 = ε4 ε10;

ε14 = ε4 ε10;

ε9 = ε4 ε10;

dbdm[u_, v_] := Plus[
  db[1][u, dσ[2, -2][v]] // dm[2, -2, 2],
  -db[1][u, dσ[2, -2][v]] // dm[-2, 2, 2],
  -db[2][u, dσ[1, -1][v]] // dm[1, -1, 1],
  db[2][u, dσ[1, -1][v]] // dm[-1, 1, 1]
];
dbdm@@{UU[a[f4[b1, b2, b3], 1, 2]], UU[a[g8[b1, b2, b4], 2, 1]]}
UU[0]

ε6 = -ε4 ε11;

ε3 = -ε4 ε10;

hmhts[u_] :=
  (u // hm[2, 1, 1] // hts[1, 4]) - (u // hts[1, 4] // hts[2, 4] // hm[2, 1, 1]);
UU[δaa[f37[b4, b5], 4, 1, 4, 2]] // hmhts
UU[0]

ε0 = ε4 ε8 ε10;

tthJacobi[u_, v_, w_] := Plus[
  -thb[0, 0][tb[0][u, v], w] + tb[0][thb[0, 0][u, w], v] - thb[0, 0][v,
    thb[0, 0][u, w]] + tb[0][u, thb[0, 0][v, w]] + thb[0, 0][u, thb[0, 0][v, w]]
];
tthJacobi@@{UU[β[f1[b0, b1]], UU[a[g2[b0, b2], 0, 3]], UU[a[h2[b3, b4], 3, 0]]}
UU[0]

ε43 = ε39;

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tmhts[u_] :=
  (u // tm[2, 1, 1] // hts[4, 1]) - (u // hts[4, 2] // hts[4, 1] // tm[2, 1, 1]);
tmhts@UU[δaa[f32[b1, b2, b3], 1, 4, 2, 4]]
UU[0]

```

$\epsilon_{15} = \epsilon_1 = \epsilon_4 \epsilon_{10}$;

Table[i → ϵ_i , {i, 0, 48}]

{0 → $\epsilon_4 \epsilon_8 \epsilon_{10}$, 1 → $\epsilon_4 \epsilon_{10}$, 2 → $\epsilon_4 \epsilon_{10}$, 3 → $-\epsilon_4 \epsilon_{10}$, 4 → ϵ_4 , 5 → ϵ_5 , 6 → $-\epsilon_4 \epsilon_{11}$, 7 → $\epsilon_8 \epsilon_{11}$,
8 → ϵ_8 , 9 → $\epsilon_4 \epsilon_{10}$, 10 → ϵ_{10} , 11 → ϵ_{11} , 12 → ϵ_{10} , 13 → ϵ_{11} , 14 → $\epsilon_4 \epsilon_{10}$, 15 → $\epsilon_4 \epsilon_{10}$,
16 → $-\epsilon_4 \epsilon_8 \epsilon_{10}$, 17 → $\epsilon_4^2 \epsilon_{11}$, 18 → $\epsilon_4^2 \epsilon_{10}$, 19 → $\epsilon_4 \epsilon_{10}$, 20 → $\epsilon_4^2 \epsilon_{10}$, 21 → $\epsilon_4 \epsilon_{10}$,
22 → $\epsilon_4^2 \epsilon_{10}$, 23 → $\epsilon_4^2 \epsilon_{10}$, 24 → $\epsilon_4^2 \epsilon_{10}$, 25 → $\epsilon_4^2 \epsilon_{10}$, 26 → $\epsilon_4^2 \epsilon_{11}$, 27 → $\epsilon_4 \epsilon_{10}$, 28 → $\epsilon_4^2 \epsilon_{10}$,
29 → $\epsilon_4 \epsilon_{10}$, 30 → $\epsilon_4^2 \epsilon_{10}$, 31 → $\epsilon_4^2 \epsilon_{10}^2$, 32 → $\epsilon_4^2 \epsilon_{10}$, 33 → $\epsilon_4^2 \epsilon_{10}$, 34 → $\epsilon_4^3 \epsilon_{10}^2$, 35 → $\epsilon_4^2 \epsilon_{10}$,
36 → $\epsilon_4^2 \epsilon_{10}$, 37 → $\epsilon_4^2 \epsilon_{10}$, 38 → $\epsilon_4^2 \epsilon_{10}$, 39 → ϵ_{39} , 40 → $\epsilon_4 \epsilon_{11}$, 41 → $\epsilon_4 \epsilon_{11}$, 42 → $\epsilon_4 \epsilon_{11}$,
43 → ϵ_{39} , 44 → $\epsilon_4 \epsilon_{11}$, 45 → $\epsilon_4^2 \epsilon_{10} \epsilon_{11}$, 46 → $\epsilon_4^2 \epsilon_{10} \epsilon_{11}$, 47 → $\epsilon_4^2 \epsilon_{10} \epsilon_{11}$, 48 → ϵ_4 }

Table[i → ϵ_i , {i, 0, 48}] /. $\epsilon_4 \rightarrow 1$

{0 → $\epsilon_8 \epsilon_{10}$, 1 → ϵ_{10} , 2 → ϵ_{10} , 3 → $-\epsilon_{10}$, 4 → 1, 5 → ϵ_5 , 6 → $-\epsilon_{11}$, 7 → $\epsilon_8 \epsilon_{11}$, 8 → ϵ_8 ,
9 → ϵ_{10} , 10 → ϵ_{10} , 11 → ϵ_{11} , 12 → ϵ_{10} , 13 → ϵ_{11} , 14 → ϵ_{10} , 15 → ϵ_{10} , 16 → $-\epsilon_8 \epsilon_{10}$,
17 → ϵ_{11} , 18 → ϵ_{10} , 19 → ϵ_{10} , 20 → ϵ_{10} , 21 → ϵ_{10} , 22 → ϵ_{10} , 23 → ϵ_{10} , 24 → ϵ_{10} ,
25 → ϵ_{10} , 26 → ϵ_{11} , 27 → ϵ_{10} , 28 → ϵ_{10} , 29 → ϵ_{10} , 30 → ϵ_{10} , 31 → ϵ_{10}^2 , 32 → ϵ_{10} ,
33 → ϵ_{10} , 34 → ϵ_{10}^2 , 35 → ϵ_{10} , 36 → ϵ_{10} , 37 → ϵ_{10} , 38 → ϵ_{10} , 39 → ϵ_{39} , 40 → ϵ_{11} ,
41 → ϵ_{11} , 42 → ϵ_{11} , 43 → ϵ_{39} , 44 → ϵ_{11} , 45 → $\epsilon_{10} \epsilon_{11}$, 46 → $\epsilon_{10} \epsilon_{11}$, 47 → $\epsilon_{10} \epsilon_{11}$, 48 → 1}