Pensieve header: Fixing many many signs for SnG.

```
SetDirectory["C:\\drorbn\\AcademicPensieve\\2016-02"];
<< SnG.m
```

```
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]
```

```
ϵ16 = ϵ8 ϵ14;
```

```
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]
```

```
ϵ7 = ϵ8 ϵ13;
```

```
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[0]
```

```
ϵ13 = ϵ11;
```

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

```
UU[0]
```

```
ϵ14 = ϵ3;
```

```
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]
```

```
ϵ15 = -ϵ1;
```

```
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[0]
```

```
ϵ12 = ϵ10;
```

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

```
UU[0]
```

```
ϵ3 = -ϵ1;
```

```
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]
```

```
ϵ2 = ϵ1;
```

```
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]
```

```
ϵ41 = ϵ40;
```

```
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]
```

```
ϵ42 = ϵ40;
```

```
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[δa[h3[b5, b6], 5, 0]]}
```

```
UU[0]
```

```
ϵ20 = ϵ18;
```

```
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]
```

```
ϵ18 = ϵ19 ϵ48;
```

```
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]
```

```
ϵ22 = ϵ19 ϵ48;
```

```
ϵ24 = ϵ19 ϵ48;

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[δaa[f28[b1, b2], 2, 0, 2, 1]],
  UU[a[g6[b3, b4], 4, 0]], UU[a[h6[b5, b6], 6, 0]]}
UU[0]

ϵ21 = ϵ19;

ϵ48 = ϵ4;

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]

ϵ23 = ϵ4 ϵ19;

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]

ϵ37 = ϵ25;

ϵ25 = ϵ4 ϵ19;

ϵ46 = ϵ45;

ϵ36 = ϵ4 ϵ19;

ϵ26 = ϵ4 ϵ44;

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[δaa[f23[b0, b1], 0, 2, 0, 2]], UU[a[g6[b2, b3], 3, 0]], UU[a[h6[b4, b5], 5, 0]]}
UU[0]

ϵ19 = 1 / ϵ4;

ϵ35 = 1;
```

```
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]
```

```
ϵ28 = ϵ4 ϵ27;
```

```
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]
```

```
ϵ33 = ϵ30;
```

```
ϵ32 = ϵ4 ϵ29;
```

```
ϵ34 = ϵ4 ϵ31;
```

```
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[δaa[h21[b4, b5], 4, 0, 4, 0]]}
```

```
UU[0]
```

```
ϵ30 = ϵ4 ϵ29;
```

```
ϵ31 = ϵ1 ϵ27;
```

```
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 = ϵ18 ϵ39 / ϵ27 / ϵ4;
```

```
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]
```

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

$$\epsilon_{17} = \epsilon_4^2 \epsilon_{29} \epsilon_{44};$$

$$\epsilon_{38} = 1;$$

```
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]
```

$$\epsilon_{11} = \epsilon_4^2 \epsilon_{10} \epsilon_{29} \epsilon_{44};$$

```
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]
```

$$\epsilon_{29} = 1 / \epsilon_4;$$

$$\epsilon_{47} = \epsilon_4 \epsilon_{10} \epsilon_{44};$$

$$\epsilon_{45} = \epsilon_1 \epsilon_{44};$$

$$\epsilon_{27} = 1 / \epsilon_4;$$

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

```
bb4 = bb[1, 2, 3, 4]; bbAS[u_, v_] := bb4[u, v] + bb4[v, u];
bbAS @@ {UU[a[f2[b1, b2], 1, 1]], UU[a[g6[b1, b2], 2, 1]]}
```

$$UU\left[c\left[-b_1 b_2 \epsilon_4 \epsilon_9 \epsilon_{44} g_6[b_1, b_2] f_2^{(0,1)}[b_1, b_2] + b_1 b_2 \epsilon_4^2 \epsilon_{10} \epsilon_{44} g_6[b_1, b_2] f_2^{(0,1)}[b_1, b_2], 1\right] + \delta a\left[-2 b_1 \epsilon_4 \epsilon_{10} \epsilon_{44} g_6[b_1, b_2] f_2^{(0,1)}[b_1, b_2], 2, 1\right]\right]$$

```
Table[i → ϵi, {i, 48}]
```

$$\Big\{1 \to \epsilon_4\,\epsilon_{10},\ 2 \to \epsilon_4\,\epsilon_{10},\ 3 \to -\epsilon_4\,\epsilon_{10},\ 4 \to \epsilon_4,\ 5 \to \epsilon_5,\ 6 \to \epsilon_6,\ 7 \to \epsilon_4\,\epsilon_8\,\epsilon_{10}\,\epsilon_{44},\ 8 \to \epsilon_8,$$
$$9 \to \epsilon_9,\ 10 \to \epsilon_{10},\ 11 \to \epsilon_4\,\epsilon_{10}\,\epsilon_{44},\ 12 \to \epsilon_{10},\ 13 \to \epsilon_4\,\epsilon_{10}\,\epsilon_{44},\ 14 \to -\epsilon_4\,\epsilon_{10},\ 15 \to -\epsilon_4\,\epsilon_{10},$$
$$16 \to -\epsilon_4\,\epsilon_8\,\epsilon_{10},\ 17 \to \epsilon_4\,\epsilon_{44},\ 18 \to 1,\ 19 \to \frac{1}{\epsilon_4},\ 20 \to 1,\ 21 \to \frac{1}{\epsilon_4},\ 22 \to 1,\ 23 \to 1,$$
$$24 \to 1,\ 25 \to 1,\ 26 \to \epsilon_4\,\epsilon_{44},\ 27 \to \frac{1}{\epsilon_4},\ 28 \to 1,\ 29 \to \frac{1}{\epsilon_4},\ 30 \to 1,\ 31 \to \epsilon_{10},\ 32 \to 1,$$
$$33 \to 1,\ 34 \to \epsilon_4\,\epsilon_{10},\ 35 \to 1,\ 36 \to 1,\ 37 \to 1,\ 38 \to 1,\ 39 \to \epsilon_{39},\ 40 \to \epsilon_{44},\ 41 \to \epsilon_{44},$$
$$42 \to \epsilon_{44},\ 43 \to \epsilon_{39},\ 44 \to \epsilon_{44},\ 45 \to \epsilon_4\,\epsilon_{10}\,\epsilon_{44},\ 46 \to \epsilon_4\,\epsilon_{10}\,\epsilon_{44},\ 47 \to \epsilon_4\,\epsilon_{10}\,\epsilon_{44},\ 48 \to \epsilon_4\Big\}$$