Pensieve header: Global testing notebook for Scatter and Glow in ZeroCo.

```
SetDirectory["C:\\drorbn\\AcademicPensieve\\Projects\\OneCo-1604\\Zero"];
<< ZeroGlobal.m
```

```
In "T before H" conventions. Internal use symbols: {rr, pp}
```

R3 for tails

```
{a[f, 1, ∞] // R[1, 2] // R[1, 3] // R[2, 3],
 a[f, 1, ∞] // R[2, 3] // R[1, 3] // R[1, 2]}
```

$$\{UU[a[f, 1, \infty]], UU[a[f, 1, \infty]]\}$$

```
{a[f, 2, ∞] // R[1, 2] // R[1, 3] // R[2, 3],
 a[f, 2, ∞] // R[2, 3] // R[1, 3] // R[1, 2]}
```

$$\left\{UU\left[a\left[e^{b_1} f, 2, \infty\right] + a\left[\frac{f\, b_2}{b_1} - \frac{e^{b_1} f\, b_2}{b_1}, 1, \infty\right]\right], UU\left[a\left[e^{b_1} f, 2, \infty\right] + a\left[\frac{f\, b_2}{b_1} - \frac{e^{b_1} f\, b_2}{b_1}, 1, \infty\right]\right]\right\}$$

```
{a[f, 3, ∞] // R[1, 2] // R[1, 3] // R[2, 3],
  a[f, 3, ∞] // R[2, 3] // R[1, 3] // R[1, 2]} // Column
```

$$UU\left[a\left[e^{b_1+b_2} f, 3, \infty\right] + a\left[\frac{f\, b_3}{b_1} - \frac{e^{b_1} f\, b_3}{b_1}, 1, \infty\right] + a\left[\frac{e^{b_1} f\, b_3}{b_2} - \frac{e^{b_1+b_2} f\, b_3}{b_2}, 2, \infty\right]\right]$$
$$UU\left[a\left[e^{b_1+b_2} f, 3, \infty\right] + a\left[\frac{f\, b_3}{b_1} - \frac{e^{b_1} f\, b_3}{b_1}, 1, \infty\right] + a\left[\frac{e^{b_1} f\, b_3}{b_2} - \frac{e^{b_1+b_2} f\, b_3}{b_2}, 2, \infty\right]\right]$$

Head Scattering

```
a[f, t∞, 1] // R[1, 2]
```

$$UU\left[a[f, t\infty, 1] + a\left[f - e^{-b_1} f, t\infty, 2\right] + a\left[-\frac{f\, b_{t\infty}}{b_1} + \frac{e^{-b_1} f\, b_{t\infty}}{b_1}, 1, 2\right]\right]$$

```
a[f, t∞, 2] // R[1, 2]
```

$$UU\left[a\left[e^{-b_1} f, t\infty, 2\right] + a\left[\frac{f\, b_{t\infty}}{b_1} - \frac{e^{-b_1} f\, b_{t\infty}}{b_1}, 1, 2\right]\right]$$

```
a[f, t∞, 3] // R[1, 2]
```

$$UU[a[f, t\infty, 3]]$$

```
Table[a[f, j, k] // R[1, 2], {j, 2}, {k, 2}]
```

$$\left\{\{UU[a[f, 1, 1]], UU[a[f, 1, 2]]\},\right.$$
$$\left.\left\{UU\left[a\left[e^{b_1} f, 2, 1\right] + a\left[-f + e^{b_1} f, 2, 2\right] + a\left[\frac{f\, b_2}{b_1} - \frac{e^{b_1} f\, b_2}{b_1}, 1, 1\right] + a\left[\frac{f\, b_2}{b_1} - \frac{e^{b_1} f\, b_2}{b_1}, 1, 2\right]\right],\right.\right.$$
$$\left.\left.UU[a[f, 2, 2]]\right\}\right\}$$

R3 for heads

```
{a[f, t∞, 1] // R[1, 2] // R[1, 3] // R[2, 3],
 a[f, t∞, 1] // R[2, 3] // R[1, 3] // R[1, 2]}
```

$$\left\{UU\left[a[f, t\infty, 1] + a\left[f - e^{-b_1} f, t\infty, 2\right] + a\left[f - e^{-b_1} f, t\infty, 3\right] + a\left[-\frac{f\, b_{t\infty}}{b_1} + \frac{e^{-b_1} f\, b_{t\infty}}{b_1}, 1, 2\right] + a\left[-\frac{f\, b_{t\infty}}{b_1} + \frac{e^{-b_1} f\, b_{t\infty}}{b_1}, 1, 3\right]\right],\right.$$
$$\left. UU\left[a[f, t\infty, 1] + a\left[f - e^{-b_1} f, t\infty, 2\right] + a\left[f - e^{-b_1} f, t\infty, 3\right] + a\left[-\frac{f\, b_{t\infty}}{b_1} + \frac{e^{-b_1} f\, b_{t\infty}}{b_1}, 1, 2\right] + a\left[-\frac{f\, b_{t\infty}}{b_1} + \frac{e^{-b_1} f\, b_{t\infty}}{b_1}, 1, 3\right]\right]\right\}$$

```
{a[f, t∞, 2] // R[1, 2] // R[1, 3] // R[2, 3],
 a[f, t∞, 2] // R[2, 3] // R[1, 3] // R[1, 2]}
```

$$\left\{UU\left[a\left[e^{-b_1} f, t\infty, 2\right] + a\left[e^{-b_1} f - e^{-b_1-b_2} f, t\infty, 3\right] + a\left[\frac{f\, b_{t\infty}}{b_1} - \frac{e^{-b_1} f\, b_{t\infty}}{b_1}, 1, 2\right] + a\left[\frac{f\, b_{t\infty}}{b_1} - \frac{e^{-b_1} f\, b_{t\infty}}{b_1} + \frac{e^{-b_1-b_2} f\, b_{t\infty}}{b_1} - \frac{e^{-b_2} f\, b_{t\infty}}{b_1}, 1, 3\right] + a\left[-\frac{f\, b_{t\infty}}{b_2} + \frac{e^{-b_2} f\, b_{t\infty}}{b_2}, 2, 3\right]\right],\right.$$
$$\left. UU\left[a\left[e^{-b_1} f, t\infty, 2\right] + a\left[e^{-b_1} f - e^{-b_1-b_2} f, t\infty, 3\right] + a\left[\frac{f\, b_{t\infty}}{b_1} - \frac{e^{-b_1} f\, b_{t\infty}}{b_1}, 1, 2\right] + a\left[\frac{f\, b_{t\infty}}{b_1} - \frac{e^{-b_1} f\, b_{t\infty}}{b_1} + \frac{e^{-b_1-b_2} f\, b_{t\infty}}{b_1} - \frac{e^{-b_2} f\, b_{t\infty}}{b_1}, 1, 3\right] + a\left[-\frac{f\, b_{t\infty}}{b_2} + \frac{e^{-b_2} f\, b_{t\infty}}{b_2}, 2, 3\right]\right]\right\}$$

```
{a[f, t∞, 3] // R[1, 2] // R[1, 3] // R[2, 3],
 a[f, t∞, 3] // R[2, 3] // R[1, 3] // R[1, 2]}
```

$$\left\{UU\left[a\left[e^{-b_1-b_2} f, t\infty, 3\right] + a\left[-\frac{e^{-b_1-b_2} f\, b_{t\infty}}{b_1} + \frac{e^{-b_2} f\, b_{t\infty}}{b_1}, 1, 3\right] + a\left[\frac{f\, b_{t\infty}}{b_2} - \frac{e^{-b_2} f\, b_{t\infty}}{b_2}, 2, 3\right]\right],\right.$$
$$\left. UU\left[a\left[e^{-b_1-b_2} f, t\infty, 3\right] + a\left[-\frac{e^{-b_1-b_2} f\, b_{t\infty}}{b_1} + \frac{e^{-b_2} f\, b_{t\infty}}{b_1}, 1, 3\right] + a\left[\frac{f\, b_{t\infty}}{b_2} - \frac{e^{-b_2} f\, b_{t\infty}}{b_2}, 2, 3\right]\right]\right\}$$

R3 for arrows

```
Table[Plus[
  a[f, j, k] // R[1, 2] // R[1, 3] // R[2, 3],
  a[-f, j, k] // R[2, 3] // R[1, 3] // R[1, 2]
 ], {j, 3}, {k, 3}]
```

```
{{UU[0], UU[0], UU[0]}, {UU[0], UU[0], UU[0]}, {UU[0], UU[0], UU[0]}}
```