

Pensieve header: OneCo, the global picture.

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

In the $U(T) \otimes U(H)$ conventions. Internal use symbols: {rr, pp}

```
Export
```

```
Exporting Snips\0Co.pdf...
```

```
Exporting Snips\Ejk.pdf...
```

```
Exporting Snips\GlobalGeneralities.pdf...
```

```
Exporting Snips\hInfinityScattering.pdf...
```

```
Done.
```

0-Co

TSD0 for "Tail Scattering Data at 0-co"

0Co

```
 $\sigma[\gamma\_TSD0] := Keys @@ \gamma;$ 
TSD0[\lambda\_j_ := Lookup[\lambda, j, UU@a[1, j, hoo]];
UU[u_] // \gamma\_TSD0 := CF[u /. \lambda\_a \Rightarrow \gamma@lambda];
TSD0 /: (\gamma\_TSD0)^{-1} := Module[{S = \sigma@\gamma, m, i, j},
  m = Table[Coefficient[\gamma_i, a[j, hoo]], {i, S}, {j, S}] // Inverse;
  TSD0@<|Table[S[[\alpha] \rightarrow
    CF@UU@Sum[a[m[[\alpha, \beta]], S[[\beta]], hoo], {\beta, Length@S}],
    {\alpha, Length@S}]]> ];
a[f_, j_, k_] // \gamma\_TSD0 := Module[{S = Keys @@ \gamma, \gamma_i, i},
  Switch[{MemberQ[S, j], MemberQ[S, k]},
    {False, False}, UU@a[f, j, k],
    {True, False}, \gamma_j /. a[g_, i_, hoo] \Rightarrow a[f g, i, k],
    {False, True}, (\gamma_i = \gamma^{-1};
  CF@Sum[
    \gamma[bb[S \cup {j}][\gamma_i, UU@a[f, j, k]] /. _\delta\beta | _\delta a | _\delta a a \rightarrow 0] /. {
      a[_ , i, hoo] \Rightarrow 0, a[g_, l_, hoo] \Rightarrow a[g/b_i, l, i]},
    {i, S}]],
  {True, True}, ct[hoo, t\omega][\gamma@a[f, j, hoo], \gamma@a[1, t\omega, k]] ]];
```

Global Generalities / hoo Scattering

TSD for "Tail Scattering Data". TSDs are always assumed to be perturbation of the identity.

GlobalGeneralities

```

TSD[λ_List] := TSD[Association@@λ];
σ[γ_TSD] := Keys@@γ;
TSD[λ_]j_ := Lookup[λ, j, UU@a[1, j, h∞]];
UU[u_] // γ_TSD := CF[u /. λ_β | λ_a | λ_δa | λ_δaa → γ@λ];
TSD0[γ_TSD] := Module[{k},
  TSD0[Table[k → CF[γ_k /. _δβ | _δa | _δaa → 0], {k, σ@γ}]];
TSD /: (γ1_TSD) ** (γ2_TSD) := Module[{k},
  TSD[Table[k → γ2[γ1_k], {k, σ[γ1] ∪ σ[γ2]}]];

```

hInfinityScattering

```

β[f_] // γ_TSD := Module[{k},
  UU[β[f]] + Sum[(* desinged to work only if "sum of each column" is 1 *)
    ct[h∞, t∞][γ_k /. _a → 0, UU[β[b_t∞ ∂_b_k f]]],
    {k, σ@γ}];
a[f_, j_, h∞] // γ_TSD := (β[f] // γ) ** γ_j;
δa[f_, ϕ, k_] // γ_TSD := ct[h∞, t∞][UU@δa[1, ϕ, h∞], TSD0[γ][a[f, t∞, k]]];
δa[f_, j_, k_] // γ_TSD := UU[δβ[1]] ** CF[a[f, j, k] // TSD0[γ]];
δaa[f_, i_, j_, k_, h∞] // γ_TSD :=
  (δa[f, i, j] // γ) ** TSD0[γ]_k + Kδ_jk γ[UU@δhb[f, i, j, h∞]];
δaa[f_, k_, h∞, i_, j_] // γ_TSD := δaa[f, i, j, k, h∞] // γ;

```

Ea

Ejk

```

ϕ_k[x_] := x^-k (e^x - Sum[x^α / α!, {α, 0, k-1}]);
Ea[t_, j_, k_] := TSD[{
  j → UU[a[1, j, h∞] + δaa[t, ϕ, h∞, j, k] +
    δaa[-t ϕ_1[-t b_j], ϕ, k, j, h∞] + δaa[-t^2 ϕ_2[-t b_j], j, k, j, h∞]],
  k → UU[a[1, k, h∞] + hb[-t ϕ_1[t b_j], j, k, h∞] + δhb[t^2 b_k e^{t b_j} ϕ_2[-t b_j], ϕ, j, h∞] +
    δaa[-t^2 b_j e^{t b_j} ϕ_2[-t b_j], ϕ, k, k, h∞] + δaa[t^2 e^{t b_j} ϕ_2[-t b_j], j, k, k, h∞] +
    δaa[-t ϕ_1[t b_j] - t^2 b_k ϕ_2[t b_j], ϕ, h∞, j, k] +
    δaa[t ϕ_1[-t b_j] + t^2 b_k e^{t b_j} ϕ_2[-t b_j], ϕ, k, j, h∞] +
    δaa[t (ϕ_1[t b_j] - ϕ_1[-t b_j]) - (2 - 2 e^{t b_j} + (1 + e^{t b_j}) t b_j) b_k / (b_j^3), j, k, j, h∞]
}];

```

```

Ea[
  j_,
  k_] :=
Ea[
  1,
  j,
  k];

```

Stitching