

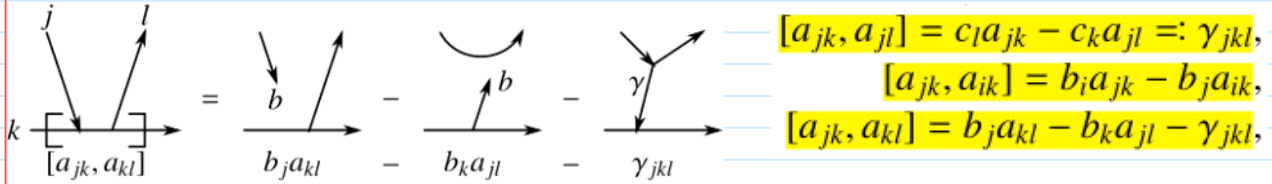
Selfie and backie commutation relations

July-30-15 3:17 AM

Convention: head above tails.

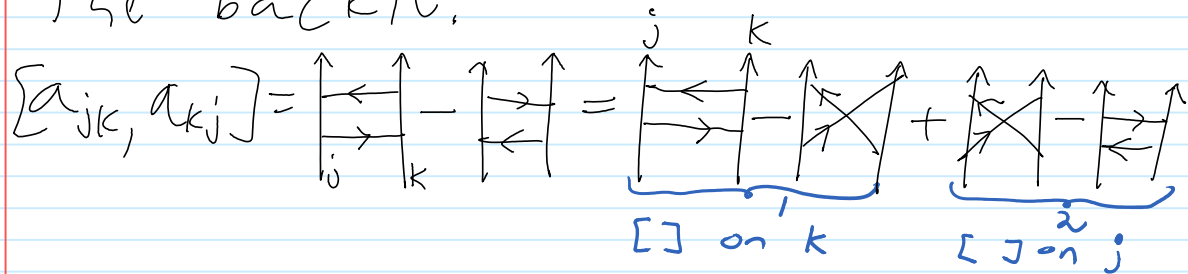
$$\gamma[f, j, k] := \delta a[f, j, k] - c[b_j, f, k] // S;$$

$$\gamma[f, j, k, l] // DQ[j, k, l] := ca[f, l, j, k] - ca[f, k, j, l] // S;$$



$$\text{ad } a_{jk}: b_j, -b_k, -c_j, c_k \mapsto \gamma_{jk} := \delta a_{jk} - b_j c_k$$

The backie:



$$\begin{aligned} \textcircled{1} &= b_j a_{kj} - b_k a_{ij} - \gamma_{jik} \\ &= b_j a_{kj} - b_k a_{ij} - c_{j_2} a_{j_1 k} + c_k a_{ij} \\ &= b_j a_{kj} - b_k a_{ij} - c_j a_{jk} + \gamma_{jk} + c_k a_{ij} \end{aligned} \quad \left\{ \begin{aligned} c_{j_2} a_{j_1 k} &= a_{jk} c_j \\ &= c_j a_{jk} + [a_{jk}, c_j] \\ &= c_j a_{jk} - \gamma_{jk} \end{aligned} \right.$$

$$\begin{aligned} \textcircled{2} &= -b_k a_{jk} + b_j a_{kk} + \gamma_{k_1 j k_2} \\ &= -b_k a_{jk} + b_j a_{kk} + c_{k_2} a_{k_1 j} - c_j a_{kk} \\ &= -b_k a_{jk} + b_j a_{kk} + c_k a_{kj} - \gamma_{kj} - c_j a_{kk} \end{aligned}$$

so $[a_{jk}, a_{kj}] = \textcircled{1} + \textcircled{2}$, no cancellations.

[Tail, selfie]:

