Conventions for Symbolic gl(*)

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1:41 PM

$$\sum_{i_1<i_2<i_3 \ldots i<_K} E_{i_2 i_5} E_{i_2 i_3} \ldots$$

$$(i,j) \longmapsto \sum_{k_1<i<k_2<k_3<j<k_4 \ldots} E_{k_1 i} E_{j k_3} E_{k_2 j} \cdot$$

$$\downarrow$$

$$(i_1, i_2) \mapsto \sum_{k_1<k_2<k_3<k_4<k_5<k_6} E_{k_1 k_2} E_{k_5 k_4} \ldots$$

$k_1 = i_1$, $k_5 = i_2$

$$\downarrow$$

allow symbols?

$$S[6, \underbrace{\{1,2\}}_{\text{external}} \to \underbrace{\{2,5\}}_{\text{local}}, W[E_{12}, E_{54}, \ldots]]$$

make into a list?

could itself be an S expression.

Issues - Products

Iteration.

Perhaps a convention should be declared that no indices are ever to be used unless their relative ordering is known.

$$gl(*) = \left\langle \sum_{i_1<i_2<\ldots<i_K} E_{i_2 i_3} E_{i_1 i_5} \ldots \right\rangle$$

$= \langle S[k, \text{word in } U(gl(k))] \rangle$

$W[E_{12}, E_{541}, \ldots]$

$$gl^*(*) = \left\langle \sum_{i_1 < \ldots < i_k} E_{i_2 i_3}^{j_1} E_{i_2 i_5}^{j_2} \ldots \right\rangle$$

A circuit algebra ... ...

(a "strand bi-algebra"?)

We need

$$sh[2,3] = \left\{ \begin{array}{l} \{3, \{1, 3\}, \{1, 2, 3\}\}, \\ \{4, \{2, 3\}, \{1, 2, 4\}\}, \\ \text{etc.} \end{array} \right\}$$

Can the co-bracket be implemented in this restricted context?

Are we happy w/ $\sum_{i<j} a_{ij} E_{ii} \wedge E_{jj}$?