

2D1b

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The  $\beta$ -Lie algebra:

$$L_n(\beta) := \langle a_{ij} \rangle \text{ over } \mathbb{Q}[c_i] \text{ models}$$

$$[a_{ij}, a_{kl}] = 0$$

$$[a_{ij}, a_{ik}] = 0$$

$$[a_{ik}, a_{jk}] = -[a_{ij}, a_{jk}] = \beta(c_i a_{jk} - c_j a_{ik})$$

$$\left| \begin{array}{c} \rightarrow \\ \downarrow \\ \rightarrow \end{array} \right| = - \left| \begin{array}{c} \rightarrow \\ \rightarrow \\ \rightarrow \end{array} \right| = \left| \begin{array}{c} \rightarrow c \\ \rightarrow \\ \rightarrow \end{array} \right| - \left| \begin{array}{c} \rightarrow \\ \rightarrow \\ \rightarrow c \end{array} \right|$$

so there is a representation of  $A^V$  on

$$\left\langle \left| \begin{array}{c} \rightarrow c \\ \rightarrow c \\ \rightarrow c \\ \rightarrow \\ \downarrow z \end{array} \right| \right\rangle = \mathbb{Q}[c_1 \dots c_n] \otimes \mathbb{Q}^n$$

$$0 \rightarrow 0 := \downarrow \quad \text{"} A^{100} \text{"}$$

$$\left| \begin{array}{c} \rightarrow \\ \rightarrow \\ \rightarrow \end{array} \right| = \sum \left| \begin{array}{c} \rightarrow 0 \\ \rightarrow 0 \\ \rightarrow 0 \end{array} \right| \left| \begin{array}{c} \rightarrow \\ \rightarrow \\ \rightarrow \end{array} \right|$$

The 2D1b Lie algebra:

$$L_n := \mathbb{Q}[c_i] a_{ij} :$$

$$\left| \begin{array}{c} \rightarrow c_i \quad c_j \leftarrow \\ \rightarrow \\ \rightarrow \end{array} \right|$$

$$\mathbb{Q}[c_i] b_{ij}^k :$$

$$\frac{1}{2} \left| \begin{array}{c} \rightarrow \\ \rightarrow \\ \rightarrow \end{array} \right| b_{ij}^k + \frac{1}{2} \left| \begin{array}{c} \rightarrow \\ \rightarrow \\ \rightarrow \end{array} \right|$$

$\psi(c_i) \sim 1$   
 $Q[c_i]$

$$\frac{1}{2} \left| \begin{array}{c} \rightarrow \\ \rightarrow \\ \rightarrow \end{array} \right|_i \rightarrow \left| \begin{array}{c} \rightarrow \\ \rightarrow \\ \rightarrow \end{array} \right|_j + \frac{1}{2} \left| \begin{array}{c} \rightarrow \\ \rightarrow \\ \rightarrow \end{array} \right|_k$$

$$\left| \begin{array}{c} \rightarrow \\ \rightarrow \\ \rightarrow \end{array} \right| = \left| \begin{array}{c} \rightarrow \\ \rightarrow \\ \rightarrow \end{array} \right| = \left| \begin{array}{c} \rightarrow \\ \rightarrow \\ \rightarrow \end{array} \right| - \left| \begin{array}{c} \rightarrow \\ \rightarrow \\ \rightarrow \end{array} \right|$$

$$\left| \begin{array}{c} \rightarrow \\ \rightarrow \\ \rightarrow \end{array} \right|_c = \left| \begin{array}{c} \rightarrow \\ \rightarrow \\ \rightarrow \end{array} \right|_b + \left| \begin{array}{c} \rightarrow \\ \rightarrow \\ \rightarrow \end{array} \right|_s = \delta \left| \begin{array}{c} \rightarrow \\ \rightarrow \\ \rightarrow \end{array} \right| - \text{sum} = 0$$

$\text{in } 10$

$$\left| \begin{array}{c} \rightarrow \\ \rightarrow \\ \rightarrow \end{array} \right| = \left| \begin{array}{c} \rightarrow \\ \rightarrow \\ \rightarrow \end{array} \right| = \left| \begin{array}{c} \rightarrow \\ \rightarrow \\ \rightarrow \end{array} \right| - \delta \left| \begin{array}{c} \rightarrow \\ \rightarrow \\ \rightarrow \end{array} \right|$$

There should be a representation of  $A^V$  on

