Prop 1

Assume that if $\{1,2,\dots,n\}$ s.t M_{ij} is finite for all $j \in \{1,2,\dots,n\}$

Let V_i denote the subspace of the algebra $(B(V)^{op} \# H_i^{op})^{cop}$ generated by

$\underline{\{(ad_\sigma x_i)^{m_{ij}}(x_j) \mid j \neq i\} \cup \{y_i^R\}}$

The subalgebra B_i of $(B(V)^{op} \# H_i^{cop})^{op}$ generated by V_i is iso to $B(V_i)$

and $\Delta^+(B_i) = \{s_i(\Delta^+(B(V)) \setminus \{-e_i\}\} \cup \{e_i\}$

Remark 1:

$\Delta(B_i)$ coincides with Δ with respect to the basis $\{s_i(e_j) \mid 1 \le i \le n\}$ in $\mathbb{Z}^n$

$\Delta(B_i) = s_i(\Delta(B(V)))$

Remark 2:

If V Cartan type, V_i

this transformation doesn't change Cartan type.

① $B_i = \ker y_i^L \otimes k[y_i^R]$

$\ker y_i^L$ is generated as an algebra by $\bigcup_{j \mid j \neq i} M_{ij}$

$B(V) = \ker y_i^L \otimes k[x_i]$

② B_i is Nichols.

③ $\Delta^+(B_i) = (s_i(\Delta^+(B(V)) \setminus \{e_i\}) \cup \{e_i\}$

Proof: In the $\mathbb{Z}^n$-graded algebra $(B(V)^{op} \# H_i^{cop, op})$

the elements x_j and y_i^R has degree $\underline{e_j}$ and $-e_i$ $\quad x_i y_i^R = 0_{B(X)}$ $\quad e_i$

Hence $(ad_\sigma x_i)^{m_{ij}}(x_j)$

have degree $\boxed{e_j + m_{ij} e_i = s_i(e_j)}$

Fix the $\mathbb{Z}^n$-degrees of ~~the generators~~ of B_i

by $\deg y_i^R := e_i$ / $\deg (ad_\sigma x_i)^{m_{ij}}(x_j) := e_j$

$\boxed{\text{Thus}}$

$s_i(\Delta^+(B_i))$ is the set of degrees of the PBW generators of B_i in $(B(V)^{op} \# H_i^{op})^{op}$

Then $\quad B_i \quad k[x_i]$

$\Delta^+(\ker y_i^L \otimes k[y_i^R]) = (\Delta^+(B(V)) \setminus \{e_i\}) \cup \{-e_i\}$

$\Vert$

$s_i(\Delta^+(B_i))$

$\delta^+(B_i)$ 是什么 $\quad e_j$

$ad_\sigma(x_i)^{m_{ij}} x_j$

$\Delta^+(B(V))$ 是什么 $\quad \underline{s_i(e_j)}$

$\underline{ad_\sigma(x_i)^{m_{ij}} x_j}$