$$A(i) \sum_{P\in S} (\pm 1)^P T_P \{ \psi_{\nu_1}(1) \cdots\cdots \psi_{\nu_N}(N) \}$$

$$= \sum_{P\in S} (\pm 1)^P T_P \{ \psi_{\nu_1}(1) \cdots\cdots A(i)\,\psi_{\nu_i}(i) \cdots \psi_{\nu_N}(N) \}$$

$$A(i)\,\psi_{\nu_i}(i) = \sum_{\lambda=1}^{\infty} \psi_\lambda(i)\, A_{\lambda i} \quad \text{mit } A_{\lambda i} = \langle \psi_\lambda | A | \psi_{\nu_i} \rangle$$

1) $\lambda = i \iff A_{\lambda\lambda}$ und $|n_1 n_2 \cdots n_{\nu_i} \cdots \rangle$

2) $\lambda \neq i \iff A_{\lambda i}$ und $|n_1 n_2 \cdots n_{\lambda}+1 \cdots n_i - 1 \cdots \rangle$

$$a_\lambda^+ a_\mu |n_1 n_2 \cdots \rangle = \sqrt{n_\lambda + 1}\sqrt{n_\mu}\, |n_1 n_2 \cdots \cdots n_\lambda + 1 \cdots n_\mu - 1 \cdots \rangle$$

$$a_\lambda^+ a_\lambda |n_1 n_2 \cdots \rangle = n_\lambda |n_1 n_2 \cdots \rangle$$

$$a_\lambda a_\lambda^+ |n_1 n_2 \cdots \rangle = (n_\lambda + 1) |n_1 n_2 \cdots \rangle$$

Vertauschungsrelation $[a_\lambda, a_\lambda^+] = 1$

VR $[a_\lambda, a_\mu^+] = \delta_{\lambda\mu} 1$

$$[a_\lambda, a_\mu] = 0 = [a_\lambda^+, a_\mu^+]$$

$$\langle 1 0 \cdots | 1 0 \cdots \rangle = \langle a_1^+ |0\rangle | a_1^+ |0\rangle \rangle$$

$|1 0 \ldots\rangle = a_1^+ |0\rangle$

$= \langle 0| a_1 a_1^+ |0\rangle = \langle 0|0\rangle$

$a_1^+ |0\rangle = |1 0 \ldots\rangle$

$a_1 a_1^+ |0\rangle = |0\rangle$

Annahme: Vakuum-Vektor ist normiert

$\langle 0|0\rangle$