Useful (anti)Commutation Relation

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Abstract

none

Contents

1 General

$$
\begin{aligned}
[A,B] &\equiv AB - BA && (1.0.1)\\
\{A,B\} &\equiv AB + BA && (1.0.2)\\
[AB,C] &= A[B,C] + [A,C]B && (1.0.3)\\
&= A\{B,C\} - \{A,C\}B && (1.0.4)\\
[C,AB] &= -[AB,C] && (1.0.5)\\
&= A[C,B] + [C,A]B && (1.0.6)\\
&= \{C,A\}B - A\{C,B\} && (1.0.7)
\end{aligned}
$$

2 2nd Quantization

2.1 Boson

$$
\begin{aligned}
n_\alpha &\equiv a_\alpha^\dagger a_\alpha && (2.1.1)\\
[a_\alpha, a_\beta] &= [a_\alpha^\dagger, a_\beta^\dagger] = 0 && (2.1.2)\\
[a_\alpha, a_\beta^\dagger] &= \delta_{\alpha\beta} && (2.1.3)
\end{aligned}
$$

2.2 Fermion

$$n_\alpha \equiv c_\alpha^\dagger c_\alpha \tag{2.2.1}$$

$$\{c_\alpha, c_\beta\} = \{c_\alpha^\dagger, c_\beta^\dagger\} = 0 \tag{2.2.2}$$

$$\{c_\alpha, c_\beta^\dagger\} = \delta_{\alpha\beta} \tag{2.2.3}$$

$$\{n_\alpha, c_\alpha\} = c_\alpha \tag{2.2.4}$$

$$\{n_\alpha, c_\alpha^\dagger\} = c_\alpha^\dagger \tag{2.2.5}$$

References

[1] No books.