
96h:81033 81S05 46L60 46N50 47N50

Jorgensen, P. E. T. (1-IA); **Schmitt, L. M.**;
Werner, R. F. (D-OSNB-P)

Positive representations of general commutation relations allowing Wick ordering. (English. English summary)

J. Funct. Anal. **134** (1995), *no.* 1, 33–99.

Let I be a set, and let $T_{ij}^{kl} \in \mathbf{C}$ for $i, j, k, l \in I$ such that for each pair i, j only finitely many $T_{ij}^{kl} \neq 0$. The algebra of polynomials in the symbols $i, i^\dagger$ for $i \in I$, divided by the relation

$$(*) \qquad i^\dagger j = \delta_{ij}\mathbf{1} + \sum_{k,l \in I} T_{ij}^{kl} l k^\dagger,$$

will be denoted by $\mathcal{W}(T)$ and called the Wick algebra. The map $i \mapsto i^\dagger$ can be extended to the involution † in $\mathcal{W}(T)$ provided that $T_{ji}^{lk} = \overline{T_{ij}^{kl}}$. The paper under review is basically about representations of $\mathcal{W}(T)$ algebras. In particular, the authors are interested in representations π of $\mathcal{W}(T)$ such that $\mathcal{W}(T) \ni i \mapsto \pi(i) \in \mathcal{B}(\mathcal{H})$ and $\pi(i^\dagger)$ is a restriction of $\pi(i)^*$, where * stands for the Hermitian conjugation in the set of all linear operators on a Hilbert space $\mathcal{H}$, while $\mathcal{B}(\mathcal{H})$ denotes the set of all linear bounded operators on $\mathcal{H}$. The paper contains criteria for existence of such representations. Also, a characterization of relations between generators $i \in \mathcal{W}(T)$ (not involving $i^\dagger$) which are compatible with the basic relations $(*)$ are given. Some natural links between noncommutative differential calculus and the structure of Wick algebras are studied. It is worth pointing out that the paper contains many very interesting and illustrative examples.

Wladyslaw Adam Majewski (PL-GDAN-TP)