Errata.


The following corrections should be made.

(1) The ETCR on p. 206 should read:
\[
[q_i(x), p_j(x')]_{x_0=x_0'} = ig_{ij}\delta^3(x-x').
\]

(2) The nontriviality condition on p. 208 should read:
\[
\wp_D \neq \emptyset \quad \text{iff} \quad B(C, C) = 0 \quad \text{iff} \quad \not\exists C^*(\delta_C - \mathbb{1}).
\]

(3) The third line of the proof of Theorem 3.1 should read:
\[
\omega(\delta_{F+\lambda C}) \exp \frac{i}{2} B(F, \lambda C) = \omega(\delta_F) = \omega(\delta_{F+\lambda C}) \exp \frac{-i}{2} B(F, \lambda C).
\]

(4) The proof of Theorem 3.2(ii) has an error, in that the simultaneous eigenvector \( \xi \) may not have the same eigenvalue 1 for all operators \( \pi(\delta_C), C \in \mathcal{C} \).

However, 3.2(ii) is contained in the following stronger statement:

**Theorem.** If \( \pi \in \tilde{\mathcal{P}} \), then \( \not\exists C \in \mathcal{Q}\setminus\{0\} \) for which \( 1 \in P_{\sigma_{\mathcal{H}_\pi}}(\pi(\delta_C)) \).

**Proof:** Let \( \pi \in \tilde{\mathcal{P}} \) be the GNS–representation of a state \( \omega \in \wp_R \), then from the weak continuity we know that all vector states associated with \( \omega \) are also in \( \wp_R \). Assume \( \exists C \in \mathcal{Q}\setminus\{0\} \) such that \( 1 \in P_{\sigma_{\mathcal{H}_\pi}}(\pi(\delta_C)) \), i.e. \( \exists \xi_C \in \mathcal{H}_\pi \) for which \( \pi(\delta_C)\xi_C = \xi_C \), so for the associated vector state, \( \omega_C(\delta_C) := (\xi_C, \pi(\delta_C)\xi_C) = 1 \), and indeed \( \omega_C(\delta_{nC}) = 1 \) \( \forall n \in \mathbb{Z} \).

Since the symplectic form \( B \) is nondegenerate, we know \( \exists F \in \mathcal{Q} \) such that \( B(F, C) \neq 0 \). Using the Cauchy–Schwartz inequality:
\[
|\omega_C((\delta_C - \mathbb{1})\delta_{\lambda F})|^2 \leq \omega_C((\delta_C - \mathbb{1})^*(\delta_C - \mathbb{1})) \omega_C(\delta_{\lambda F}^*\delta_{\lambda F})
\]
\[
= \omega_C(2 - \delta_C - \delta_{-C}) = 0
\]
we find \( \omega_C((\delta_C - \mathbb{1})\delta_{\lambda F}) = 0 \) \( \forall \lambda \in \mathbb{R} \), and similarly that \( \omega_C(\delta_{\lambda F}(\delta_C - \mathbb{1})) = 0 \) \( \forall \lambda \in \mathbb{R} \). Then \( \forall \lambda \in \mathbb{R} : \)
\[
\omega_C(\delta_{C+\lambda F}) \exp \frac{-i}{2} B(C, \lambda F) - \omega_C(\delta_{\lambda F})
\]
\[
= 0 = \omega_C(\delta_{C+\lambda F}) \exp \frac{i}{2} B(C, \lambda F) - \omega_C(\delta_{\lambda F})
\]
If for \( \lambda \neq 0 \) we take \( \omega_C(\delta_{C+\lambda F}) \neq 0 \), then \( B(C, \lambda F) = 4n\pi \), \( n \in \mathbb{Z} \), \( \forall \lambda \in \mathbb{R}\setminus 0 \), and since \( B(C, F) \neq 0 \), this is impossible to satisfy for all \( \lambda \in \mathbb{R}\setminus 0 \), so we conclude that \( \omega_C(\delta_{C+\lambda F}) = 0 \) \( \forall \lambda \notin 4\pi\mathbb{Z}/B(F, C) \), hence \( \omega_C(\delta_{F}) = 0 \) \( \forall \lambda \in (0, 4\pi/B(F, C)) \).

Since \( \omega_C(\delta_{0}) = 1 \), this means that \( \omega_C \) is not regular, which contradicts \( \omega \in \wp_{\mathbb{R}} \), and so the assumption \( \exists C \in \mathbb{Q}\setminus 0 \) such that \( 1 \in \mathbb{P}_{\sigma_{\omega}}(\pi(\delta_C)) \) must be wrong.