ERRATA

Gen KUROKI

There are some errors in the paper "Fock space representations of affine Lie algebras and integral representations in the Wess-Zumino-Witten models," nevertheless they are not serious.

First the equation (0.5-3) must be the following form:

$$\left[f\frac{d}{dt},\, X\otimes g\right] = X\otimes f\frac{dg}{dt} \qquad \text{for } X, Y\in\mathfrak{g}, \text{ and } f, g\in\mathbb{C}[t,t^{-1}]. \tag{0.5-3}$$

Second it is not correct that the author wrote "By Lemma 3.3" in the proof of the uniqueness of the correction terms in Theorem 4.1. But the uniqueness of them can be easily obtained if one makes attempt to determine the explicit forms of them by direct calculation. See the proof of Proposition 4.2. Of course we can prove it along the original proof using Lemma 3.3' bellow.

Lemma 3.3'. $\widetilde{H}^1(\mathcal{L}\mathfrak{g}\oplus\mathfrak{d}, \widehat{\mathcal{O}}\,) = 0$

Proof. Applying Lemma 3.2 to $\mathcal{S}' = \mathcal{L}\mathfrak{b}_-\oplus\mathfrak{d}$, we obtain

$$\widetilde{H}^p(\mathcal{L}\mathfrak{g}\oplus\mathfrak{d}, \widehat{\mathcal{O}}\,) \simeq \widetilde{H}^p(\mathcal{L}\mathfrak{b}_-\oplus\mathfrak{d}, \mathbb{C})$$

and using Lemma 3.6 we find

$$\widetilde{H}^p(\mathcal{L}\mathfrak{b}_-\oplus\mathfrak{d}, \mathbb{C}) \simeq \widetilde{H}^p(\mathcal{L}\mathfrak{h}\oplus\mathfrak{d}, \mathbb{C}).$$

Put $\mathcal{S} := \mathcal{L}\mathfrak{h}\oplus\mathfrak{d}$. Then $[\mathcal{S},\mathcal{S}] = \mathcal{S}$ and this implies $\widetilde{H}^1(\mathcal{L}\mathfrak{h}\oplus\mathfrak{d}, \mathbb{C}) = 0$. Hence $\widetilde{H}^1(\mathcal{L}\mathfrak{g}\oplus\mathfrak{d}, \widehat{\mathcal{O}}\,) = 0$. $\square$

Third the equations (5.9-3) and (5.12) are corrected as bellow:

$$F_j(z)s_i(w) \sim -\kappa\delta_{i,j}\frac{2}{(\alpha_i|\alpha_i)}\frac{\partial}{\partial w}\left\{\frac{V_i(w)}{z-w}\right\} \qquad \text{for } j = 1,\cdots,r. \tag{5.9-3}$$

$$\begin{aligned} F_j(z)s_i(w) &\sim \frac{\delta_{i,j}{:}p_i(w)V_i(w){:} + A(w)V_i(w)}{z-w} + \frac{B(w)V_i(w)}{(z-w)^2} \\ &= \frac{2}{(\alpha_i|\alpha_i)}\frac{-\kappa\delta_{i,j}\partial V_i(w)}{z-w} + \frac{A(w)V_i(w)}{z-w} + \frac{B(w)V_i(w)}{(z-w)^2}, \end{aligned} \tag{5.12}$$