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ERRATA: PRINCIPAL SERIES WHITTAKER FUNCTIONS ON $Sp(2; \boldsymbol{R})$, II

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This is the correction of our paper cited in the title.

Let $\pi(P_1; (\varepsilon, D_k^-); \nu_1 + \rho_{P_1})$ be a principal series representation of odd type considered in Proposition 2.1 (ii). The cause of mistake is that the corner K-type of this representation was wrongly specified; namely in the page 248, we should read "max(λ_2, k)" as "λ_2" in the line 2 and "$\tau_{(l,l-1)}$ (resp. $\tau_{(l,-k-1)}$)" as "$\tau_{(l+1,l)}$ (resp. $\tau_{(l+1,-k)}$)" in the line 6.

On the second line in Section 7, $\tau_{(k+1,k)}$ should be replaced by $\tau_{(k,k-1)}$. Therefore the down shift operator $\mathcal{E}_k^{\mathrm{down}}$ in Subsection 7.2 should read

$$\mathcal{E}_k^{\mathrm{down}} : C^\infty_{\eta,(k,k-1)}(N\backslash G/K) \to C^\infty_{\eta,(k-1,k-2)}(N\backslash G/K)\,.$$

We have to replace the following Definition 7.2 by

$$c_i(a) = a_1^{k+2-i} a_2^{k-i} e^{-\sqrt{-1}\eta_{2e_2} a_2^2} h_i(a)\,, \quad i = 0, 1\,.$$

Then the functions h_i satisfy the following equations:

$$\text{(i)} \qquad \eta_{e_1-e_2} a_1^2 h_0(a) + \partial_1 h_1(a) = 0\,,$$

$$\text{(ii)} \qquad a_2^2 \partial_2 h_0(a) + \eta_{e_1-e_2} h_1(a) = 0\,,$$

$$\text{(iii)} \qquad \big((\partial_1+\partial_2)^2 + 2k(\partial_1+\partial_2) - 4\sqrt{-1}\eta_{2e_2} a_2^2 \partial_2\big) h_0(a) = (\nu_1^2 - k^2) h_0(a)\,,$$

$$\text{(iv)} \qquad \big((\partial_1+\partial_2)^2 + 2(k-2)(\partial_1+\partial_2) - 4\sqrt{-1}\eta_{2e_2} a_2^2 \partial_2\big) h_1(a) = \big(\nu_1^2 - (k-2)^2\big) h_1(a)\,.$$

From the equations (i) and (ii), we obtain

$$\left(\partial_1\partial_2 - \eta_{e_1-e_2}^2 \left(\frac{a_1}{a_2}\right)^2\right) h_i(a) = 0$$

for $i = 0, 1$. We introduce the integral transforms

$$h_i(a) = \int_{\boldsymbol{R}} \phi_i(u) \exp\left\{ c\left(\frac{u}{a_2^2} - \frac{\eta_{e_1-e_2}^2}{4u} a_1^2\right)\right\} \frac{du}{u}\,,$$

and put $\phi_0(u) = v^{-1/2-k}\psi_0(v)$ and $\phi_1(u) = v^{-1/2-k+2}\psi_1(v)$ with $v = \sqrt{u}$. Then we see that those satisfy

$$v^2 \frac{d^2\psi_i}{dv^2} + \left(\frac{1}{4} - \nu_1^2 - 8\sqrt{-1}\eta_{2e_2} v^2\right)\psi_i = 0$$