THE KNAPP-STEIN DIMENSION THEOREM FOR
p-ADIC GROUPS. CORRECTION

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The last paragraph of [1] should be replaced by the following:

If the set $\Sigma''$ of $\omega$-special roots is empty, there are no singularities, hence nothing to prove, so we may assume $\Sigma'' \neq \emptyset$. Let $\alpha_1^\star$ be the subspace of $\alpha^\star$ spanned by $\Sigma''$. Since $W(\omega)$ stabilizes $\Sigma''$, $W(\omega)$ stabilizes $\alpha_1^\star$ too. As every hyperplane $H_\alpha$ ($\alpha \in \Sigma''$) intersects $\alpha_1^\star$, it is enough to prove that $\Phi(1, \nu)$ restricted to $\alpha_1^\star$ is holomorphic.

Let $\alpha \in \Sigma''$ and $\nu_0 \in (H_\alpha \cap \alpha_1^\star) - \bigcup \alpha' \neq \alpha H_\alpha$. We shall show that $\Phi(1, \nu)$ is holomorphic at $\nu = \nu_0$, $\nu \in \alpha_1^\star$. To see this, note first that $W(\omega_\alpha) \cap W''(\omega) = \{1, s_\alpha\}$, which follows from well-known properties of Weyl groups. We may choose representatives $s_1, \ldots, s_r \in \{1, s_\alpha\} \setminus W(\omega)$ such that $s_i$ and $s_\alpha s_i$ fix $H_\alpha \cap \alpha_1^\star$ for all $i = 1, \ldots, r$. Since an orthogonal linear transformation which fixes a hyperplane is either a reflection or the identity, we may assume that $s_i$ acts as the identity on $\alpha_1^\star$ for every $i$. Choosing a set of representatives for $W''(\omega)/\{1, s_\alpha\}$, we may write

$$\Phi(1, \nu) = \sum_{t \in W''(\omega)/\{1, s_\alpha\}} (c_{P|P}(t : \omega : \nu) \psi_{X_{t, \nu}} + c_{P|P}(t s_\alpha : \omega : \nu) \psi_{X_{t s_\alpha, \nu}}).$$

It is enough to show that

$$c_{P|P}(t : \omega : \nu) \psi_{X_{t, \nu}} + c_{P|P}(t s_\alpha : \omega : \nu) \psi_{X_{t s_\alpha, \nu}}$$

is holomorphic at $\nu = \nu_0$ for each representative $t \in W''(\omega)/\{1, s_\alpha\}$ in order to conclude that $\Phi(1, \nu)$ is holomorphic at $\nu = \nu_0$, hence that the singularity set of $\Phi(1, \nu)$ contains no piece of $H_\alpha$ near $\nu = 0$.

To check that

$$c_{P|P}(t : \omega : \nu) \psi_{X_{t, \nu}} + c_{P|P}(t s_\alpha : \omega : \nu) \psi_{X_{t s_\alpha, \nu}}$$

is holomorphic at $\nu = \nu_0$, note that there is a neighborhood $V$ of $\nu_0$ on which

$$E_{(\omega_\alpha)'}(P : \psi : \nu) = \sum_{i=1}^r (c_{P|P}(t s_i : \omega : \nu) \psi_{X_{t s_i, \nu}} + c_{P|P}(t s_\alpha s_i : \omega : \nu) \psi_{X_{t s_\alpha s_i, \nu}})$$

is holomorphic. For all $\nu \in V \cap \alpha_1^\star$ and $i = 1, \ldots, r$,

$$c_{P|P}(t s_i : \omega : \nu) \psi_{X_{t s_i, \nu}} + c_{P|P}(t s_\alpha s_i : \omega : \nu) \psi_{X_{t s_\alpha s_i, \nu}}$$

$$= c_{P|P}(t : \omega : \nu) \psi_{X_{t, \nu}} + c_{P|P}(t s_\alpha : \omega : \nu) \psi_{X_{t s_\alpha, \nu}}.$$

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It follows that $c_{p|p}(t : \omega : \nu)\psi_X^\nu + c_{p|p}(ts_\alpha : \omega : \nu)\psi_X^\nu$ is holomorphic on $V \cap a_i^*$ for each $t$. Thus, $\Phi(1, \nu)$ is holomorphic at $\nu = \nu_0$ on $a_i^*$; this implies that the singularity set of $\Phi(1, \nu)$ contains no piece of the hyperplane $H_\alpha$ near $\nu = 0$ in $a^*$. Since $\alpha \in \Sigma''$ is arbitrary, the singularity set of $\Phi(1, \nu)$ contains no piece of hypersurface near $\nu = 0$, so $\Phi(1, \nu)$ is holomorphic at $\nu = 0$. This proves the theorem.

REFERENCES