Erratum to: Intersection cohomology of Drinfeld’s compactifications (Sel. math., New ser. 8 (2002), 381–418)

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Let X be a smooth complete curve, G a reductive group, and $P \subset G$ a parabolic. Let Bun_G (resp., Bun_P) be the moduli space (stack) of G -bundles (resp., P -bundles) on X .

Following Drinfeld, one introduces a relative compactification $\widetilde{\mathrm{Bun}}_P$ of Bun_P along the fibers of the natural projection $\mathrm{Bun}_P \rightarrow \mathrm{Bun}_G$. The resulting stack $\widetilde{\mathrm{Bun}}_P$ is singular, and the goal of the paper is to study its singularities.

We find a local model for Bun_P , which allows us to compute the Intersection Cohomology sheaf $\mathrm{IC}_{\widetilde{\mathrm{Bun}}_P}$. It turns out that the stalks of $\mathrm{IC}_{\widetilde{\mathrm{Bun}}_P}$ carry some significant representation-theoretic information. They can be expressed in terms of the Langlands dual Lie algebra and are related to the modified Eisenstein series, introduced recently by Braverman–Kazhdan.

(1) The following must be added at the end of Sect. 3:

The above shows that a point of $\widetilde{\mathrm{Bun}}_P$ belonging to a stratum ${}_{\theta}\widetilde{\mathrm{Bun}}_P$ is (locally in the smooth topology) equivalent to a point of ${}_{\theta}Z^{\theta'}$ for some θ' with $\theta' - \theta \in \Lambda_{G,P}^{\mathrm{pos}}$. In fact, we claim that one can assume that $\theta' = \theta$. This is needed in order to obtain the description of $\mathrm{IC}_{\widetilde{\mathrm{Bun}}_P}$ from Theorem 4.5.

Indeed, let our point $(\mathcal{F}_G, \mathcal{F}_M, \kappa) \in {}_{\theta}\widetilde{\mathrm{Bun}}_P$ have singularities at $x_1, \dots, x_n \in X$, and let $\mathcal{F}_P$ be the corresponding P -bundle obtained by saturating κ . We can find a reduction $\mathcal{F}_{P^-}$ of $\mathcal{F}_G$ to P^- , which is in generic position with $\mathcal{F}_P$ at $x_1, \dots, x_n$, and such that the induced M -bundle $\mathcal{F}'_M$ belongs to Bun_M^r . Then, according to Proposition 3.2, $(\mathcal{F}_G, \mathcal{F}_M, \kappa, \mathcal{F}_{P^-})$ defines a point of ${}_{\theta}Z^{\theta'}$ for some θ' . However, by the Factorization property, Proposition 2.4, this point is étale-locally equivalent to a point in the product ${}_{\theta}Z^{\theta} \times Z_{\max}^{\theta' - \theta}$, and we know that the second factor is smooth.

(2) The first paragraph of Sect. 4.1 must read as follows:

For $\theta \in \Lambda_{G,P}^{\mathrm{pos}}$, let $\mathfrak{P}(\theta)$ denote an element of the set of partitions of θ as a sum $\theta = \sum_k \theta_k$, where each θ_k is such that the isotypic component $\check{\mathfrak{u}}(P)_{\theta_k}$ is non-trivial.

Recall that in this case, $\check{\mathbf{u}}(P)_{\theta_k}$ is irreducible as a representation of the dual Levi $\check{M}$, and we will denote by $\sharp(\theta_k) \in \Lambda_M^+ \subset \Lambda_G$ its highest weight vector. We always have $\sharp(\theta_k) \leq_M \flat(\theta_k)$.

(3) On line 19 on page 401 (i.e., line 5 in the fifth paragraph of Sect. 4.1) one must have $\sharp(\theta_k)$ instead of $\flat(\theta_k)$.

(4) In the proof of Lemma 4.3 one must everywhere replace $\flat(\theta_k)$ by $\sharp(\theta_k)$.

(5) In the proof of Lemma 4.3, the scheme $\prod_m (\mathrm{Gr}_{M,X}^{\sharp(\theta_k)})^{\times n_m}$ must be replaced by the corresponding iterated convolution diagram.

In more detail, for $\theta = \sum_k \theta_k$, we regard the $\{\theta_k\}$, $k = 1, \dots, l$ (of course, $l = \sum_m n_m$) as a set with multiplicities, and we choose an order on it. We need the scheme that classifies the data of points $(x_1, \dots, x_l) \in X$, principal M -bundles $\mathcal{F}_M^1, \dots, \mathcal{F}_M^{l+1}$ on X ; and isomorphisms $\beta_k : \mathcal{F}_M^k|_{X-x_k} \simeq \mathcal{F}_M^{k+1}|_{X-x_k} \in \overline{\mathcal{H}}_M^{\sharp(\theta_k)}$, where $\overline{\mathcal{H}}_M^{\sharp(\theta_k)}$ is the corresponding closed substack in the Hecke stack, i.e., the relative over Bun_M version of $\overline{\mathrm{Gr}}_M^{\sharp(\theta_k)}$.

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Reference

- [1] A. Braverman, M. Finkelberg, D. Gaietsgory and I. Mirković. Intersection cohomology of Drinfeld's compactifications. *Sel. Math. (New series)* **8** (2002), 381–418.

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