ERRATUM TO: VANISHING THEOREMS AND CHARACTER FORMULAS FOR THE HILBERT SCHEME OF POINTS IN THE PLANE [1]

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Notation is the same as in [1], §5.

The last sentence in the proof of [1, Lemma 5.1] is in error. In the statement of the lemma, "$n-3$" should be replaced by $n-2$, for $n>3$. The restatement in the paragraph which follows should state that for $n>3$, the cuvilinear locus has codimension 1 in Z_n.

With the above correction, the complement of the open set $U' = U \cup U_x \cup U_y$ referred to in the paragraph preceding the lemma has codimension n, not $n+1$. This affects the proof of [1, Theorem 2.1], in which the codimension bound was used to deduce the exactness of the complex [1, (138)] from its exactness on U'. The proof can be modified to go through with the weaker codimension bound, as follows.

The resolution $A_{\bullet}$ of $R(n,l)$ in [1, (137)] may be chosen so that $A_0 = \mathbb{C}[\mathbf{x},\mathbf{y},\mathbf{a},\mathbf{b}]$. Then in [1, (138)], we have $C_1 = \mathcal{O}_{H_n}[\mathbf{a},\mathbf{b}]$. Now, $B^{\otimes l}$ is a sheaf $\mathcal{O}_{H_n}[\mathbf{a},\mathbf{b}]/J$ of $\mathcal{O}_{H_n}$ algebras, and the map $C_1 \to B^{\otimes l}$ is the canonical surjection. The complex [1, (138)] is therefore the concatenation of the short exact sequence $0 \to J \to \mathcal{O}_{H_n}[\mathbf{a},\mathbf{b}] \to B^{\otimes l} \to 0$ with a complex

$$0 \to C_n \to \cdots \to C_2 \to J \to 0 \tag{1}$$

whose exactness is equivalent to that of [1, (138)]. Since $\mathcal{O}_{H_n}[\mathbf{a},\mathbf{b}]$ and $B^{\otimes l}$ are locally free, so is J. The rest of the proof of [1, Theorem 2.1] now shows that (1) is exact on U'. Since the complement of U' has codimension n, it follows that (1) and [1, (138)] are exact everywhere.

References

[1] Mark Haiman, *Vanishing theorems and character formulas for the Hilbert scheme of points in the plane*, Invent. Math. **149** (2002), no. 2, 371–407, arXiv:math.AG/0201148.

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