Erratum to: Subnormality of Generalized Creation Operators on Bargmann's Space of an Infinite Order

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Abstract. The purpose of this note is to correct an error in [1].

Mathematics Subject Classification (2010). Primary 47B20;
 Secondary 47B32.

Keywords. Creation operator, Bargmann Hilbert space, subnormality.

This is a correction in the proof to Lemma 6 of [1]. We begin by replacing the incorrect formula in the fifth line of this proof by the following one

$$(A_a^+|_{\mathcal{M}})f^n = (A_a^1 f)(n) + (A_a^2 f)(n), \quad n \in \mathbb{N}, \quad (5.12.1)$$

where

$$\begin{aligned} (A_a^1 f)(n) &:= \sum_{\beta \in \pi_1(n)} \left[\sum_{i=1}^n f_{\beta-\delta_i} \bar{a}_i \sqrt{\beta_i} \right] e_{\beta}, \\ (A_a^2 f)(n) &:= \sum_{\beta \in \pi_2(n)} \left[\sum_{i=n+1}^{\infty} f_{\beta-\delta_i} \bar{a}_i \sqrt{\beta_i} \right] e_{\beta}, \\ \pi_1(n) &:= \mathfrak{S}(n, 0, n+1) \text{ and } \pi_2(n) := \mathfrak{S}(n, 1, n+1). \end{aligned}$$

Clearly $\pi_1(n) \cap \pi_2(n) = \emptyset$ and $\pi_1(n) \subset \pi_1(n+1)$ for all $n \in \mathbb{N}$, and $\bigcup_{n \in \mathbb{N}} \pi_1(n) = \mathfrak{S}$. Since $f \in D(A_a^+)$, the sum $\sum_{\beta \in \mathfrak{S}} \left| \sum_{i=1}^{\infty} f_{\beta-\delta_i} \bar{a}_i \sqrt{\beta_i} \right|^2$ is finite. Hence

$$\begin{aligned} (A_a^1 f)(n) &:= \sum_{\beta \in \pi_1(n)} \left[\sum_{i=1}^{\infty} f_{\beta-\delta_i} \bar{a}_i \sqrt{\beta_i} \right] e_{\beta} \xrightarrow{n \rightarrow \infty} \sum_{\beta \in \mathfrak{S}} \left[\sum_{i=1}^{\infty} f_{\beta-\delta_i} \bar{a}_i \sqrt{\beta_i} \right] e_{\beta} \\ &= A_a^+ f. \end{aligned} \quad (5.12.2)$$

Moreover

$$\begin{aligned}
 \|A_a^2(n)\|^2 &:= \sum_{\beta \in \pi_2(n)} \left| \sum_{i=n+1}^{\infty} f_{\beta-\delta_i} \bar{a}_i \sqrt{\beta_i} \right|^2 \\
 &= \sum_{\beta \in \pi_2(n)} |f_{p_n(\beta)} \bar{a}_{i(\beta)}|^2 = \sum_{\substack{\alpha \in Z_+^n \\ |\alpha| \leq n}} \sum_{i=n+1}^{\infty} |f_\alpha|^2 |a_i|^2 \\
 &= \left(\sum_{\substack{\alpha \in Z_+^n \\ |\alpha| \leq n}} |f_\alpha|^2 \right) \left(\sum_{i=n+1}^{\infty} |a_i|^2 \right) \xrightarrow{n \rightarrow \infty} 0 \quad (\text{because } f \in B \text{ and } a \in l^2),
 \end{aligned}$$

where $p_n(\beta) := (\beta_1, \dots, \beta_n, 0, 0, \dots)$ and $i(\beta) \in \mathbb{N}$ is such that

$$\beta = (\beta_1, \dots, \beta_n, 0, \dots, 0, \underbrace{1}_{i(\beta)}, 0, 0, \dots).$$

As a consequence, we have

$$A_a^2(n) \rightarrow 0 \text{ as } n \rightarrow \infty. \quad (5.12.3)$$

It follows from (5.12.1), (5.12.2) and (5.12.3) that $(A_a^+|_{\mathcal{M}})f^n \rightarrow A_a^+f$ in B , and thus the pair $(f, \overline{A_a^+f})$ belongs to the graph of $\overline{A_a^+|_{\mathcal{M}}}$. This completes the proof.

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Reference

- [1] Stochel, J.B.: Subnormality of generalized creation operators on Bargmann's space of an infinite order. Integr. Equat. Oper. Th. **15**, 1011–1032 (1992)

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