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## Corrigendum to “Spectral analysis for rank one perturbations of diagonal operators in non-archimedean Hilbert space”

TOKA DIAGANA, GEORGE D. MCNEAL

*Keywords:* non-archimedean Hilbert space, fractional non-archimedean Hilbert space, bounded operator, operator adjoint, succession operator

*Classification:* 47S10, 46S10

In the paper [*Spectral analysis for rank one perturbations of diagonal operators in non-archimedean Hilbert space*, Comment. Math. Univ. Carolin. **50** (2009), no. 3, 385–400] by T. Diagana and G.D. Mc Neal, one needs to replace assumption (vi) [in Section 4, Spectral Analysis], that is: Replace:

“(vi)  $0 < m_\alpha := \inf_{j \in \mathbb{N}} |\alpha_j| |\omega_j|^{1/2} \leq \|X - \alpha_0 e_0\| = \sup_{j \geq 1} |\alpha_j| |\omega_j|^{1/2} < \widehat{m}$ , where  $\widehat{m}$  is the constant appearing in (v).”

with the following:

“(vi)  $\|X - \alpha_0 e_0\| = \sup_{j \geq 1} |\alpha_j| |\omega_j|^{1/2} < \widehat{m}$ , where  $\widehat{m}$  is the constant appearing in (v).”

Indeed, since  $X \in c_0(\mathbb{N}, \omega, \mathbb{K})$ , it does make sense to suppose that

$$\inf_{j \in \mathbb{N}} |\alpha_j| |\omega_j|^{1/2} = m_\alpha > 0.$$

Consequently, the proof of Proposition 4.3(ii) needs to be slightly modified as follows: Replace:

“Using assumption (vii) it follows that

$$\begin{aligned} \left| \left( \frac{\lambda_j - 1}{\lambda_j - \theta_j} \right) x_j \right| &= \left| \left( \frac{\lambda_j - 1}{-\omega_j \alpha_j \beta_j} \right) x_j \right| \\ &= \frac{|\lambda_j - 1|}{|\alpha_j| |\omega_j|^{1/2}} \|x_j \widehat{e}_j\| \\ &\leq \frac{\max(1, \widehat{M})}{m_\alpha} \cdot \|x_j \widehat{e}_j\|. \end{aligned}$$

Now  $|x_0| = \lim_{j \rightarrow \infty} \left| \left( \frac{\lambda_j - 1}{\lambda_j - \theta_j} \right) x_j \right| = 0$ , as  $\lim_{j \rightarrow \infty} \|x_j \widehat{e}_j\| = 0$ .”

with the following:

“Using assumption facts  $|\omega_j| > 1$  for all  $j \geq 1$  and  $|\alpha_j \beta_j| = 1$  for all  $j \in \mathbb{N}$  [see assumption (vii) and Remark 4.1(1)] it follows that for all  $j \geq 1$ ,

$$\begin{aligned} \left| \left( \frac{\lambda_j - 1}{\lambda_j - \theta_j} \right) x_j \right| &= \left| \left( \frac{\lambda_j - 1}{-\omega_j \alpha_j \beta_j} \right) x_j \right| \\ &= \frac{|\lambda_j - 1|}{|\alpha_j| |\omega_j|^{1/2}} \|x_j \hat{e}_j\| \\ &= \frac{|\beta_j| |\lambda_j - 1|}{|\omega_j|^{1/2}} \|x_j \hat{e}_j\| \\ &= \frac{|\lambda_j - 1| |\beta_j| |\omega_j|^{1/2}}{|\omega_j|} \|x_j \hat{e}_j\| \\ &\leq \max(1, \widehat{M}) \frac{|\beta_j| |\omega_j|^{1/2}}{|\omega_j|} \cdot \|x_j \hat{e}_j\| \\ &< \max(1, \widehat{M}) |\beta_j| |\omega_j|^{1/2} \cdot \|x_j \hat{e}_j\|. \end{aligned}$$

Now  $|x_0| = \lim_{j \rightarrow \infty} \left| \left( \frac{\lambda_j - 1}{\lambda_j - \theta_j} \right) x_j \right| = 0$ , as  $\lim_{j \rightarrow \infty} |\beta_j| |\omega_j|^{1/2} = 0$ , and  $\lim_{j \rightarrow \infty} \|x_j \hat{e}_j\| = 0$ .”

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#### REFERENCES

- [1] Diagana T., McNeal G.D., *Spectral analysis for rank one perturbations of diagonal operators in non-archimedean Hilbert space*, Comment. Math. Univ. Carolin. **50** (2009), no. 3, 385–400.

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