Dynamics of Continuous, Discrete and Impulsive Systems
Series **B:** *Applications & Algorithms* **14 (2007)** 753-753
 http://www.watam.org

Erratum to "Non-Fragile Controllers of Peak Gain Minimization For Uncertain Systems Via LMI Approach"

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In paper [1], an important condition of the main Lemma (Lemma 2.2) was missed. The corrected Lemma should be as follows.

Lemma 2.2. Given a symmetric matrix G, and nonzero matrices M, N. Then

$$G + M\Delta N + N^T\Delta^T M^T \leq 0$$

for all Δ satisfying $\Delta^T\Delta \leq I$ if and only if there exists a constant $\epsilon > 0$ such that

$$G + \epsilon MM^T + \frac{1}{\epsilon}N^T N \leq 0.$$

The condition that M and N are nonzero matrices is necessary. When $G = 0, N = 0$ and $M = I$, the result does not hold. In fact, the condition was used in the original proof in [1]. However, the corresponding results in paper [1] are not affected by the above correction. For example, E, H_A in Theorem 3.1 are not zero matrices. If this is not the case, then the uncertain system is a trivial one. Thus, E, PH_A are nonzero because of the nonsingularity of P. So, Theorem 3.1 satisfies the condition of the corrected Lemma. Other results related to uncertainties also hold under the corrected Lemma.

Acknowledgements

The author would like to express his best gratitude to Professor Jifeng Zhang (Chinese Academy of Sciences) who pointed out this error to him. The author thanks also Professor Guanrong Chen for improvement of the language. This paper was supported by the NSFC (No. 60504018).

References

[1] F. Hao, T. Chu, L. Huang, and L. Wang, "Non-fragile controllers of peak gain minimization for uncertain systems via LMI approach", *Dynamics of Continuous, Discrete and Impulsive Systems, Series B: Applications & Algorithms* 10 (2003) 681-693.