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Reply to "Comments on 'Mittag-Leffler stability of fractional order nonlinear dynamic systems' [Automatica 45(8) (2009) 1965–1969]"☆

It was stated in Naifar, Makhlouf, and Hammami (2017) that "However, the negative sign of ${}_0^C D_t^\beta V(t, x(t))$ does not imply the monotonicity of $V(t, x(t)), \cdots$. Hence, monotonic decay of $V(t, x(t))$ does not follow from Lemma $10 \cdots$".

It has been obvious that the negative sign of ${}_0^C D_t^\beta V(t, x(t))$, where $\beta \in (0, 1)$, does not imply the monotonicity of $V(t, x(t))$. In the proof of Theorem 11 in Li, Chen, and Podlubny (2009), the boundedness of $V(t, x(t))$ was proved by using Lemma 10, i.e. $V(t, x(t)) \leq V(0, x(0))$. The monotonicity of $V(t, x(t))$ was not used.

The results in Li et al. (2009) are correct. More generalization is possible when smoothness condition changes.

References

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