

**GENERALIZED S-PROCEDURE,
EXTENDED YAKUBOVICH-KALMAN-POPOV LEMMA
AND RELAXED DISSIPATIVITY**

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A brief survey of recent breakthroughs in control theory related to a finite-frequency extension of Yakubovich-Kalman-Popov (KYP) lemma will be given. The results linking S-procedure with infinite number of constraints to a version of KYP Lemma for frequency domain inequalities over a finite frequency range and dissipation inequality for “slow” trajectories [1-3] will be presented.

References

- [1] Iwasaki, T., G. Meinsma, and M. Fu, Generalized S-procedure and finite frequency KYP lemma, *Mathematical Problems in Engineering*, 2000, **6**, 305–320.
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- [3] Iwasaki, T., S. Hara, and A. L. Fradkov, Restricted frequency inequality is equivalent to restricted dissipativity, *Proc. 43th IEEE Conf. Dec. Control*, 2004, 426–431.