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Dissipativity in nonautonomous linear-quadratic control processes

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This talk concerns the concept of the Willems dissipativity for nonautonomous linear-quadratic control problems. A nonautonomous system of Hamiltonian ODEs can be associated with such a linear-quadratic problem, and the analysis of the corresponding symplectic dynamics provides valuable information on the dissipativity properties. The existence of globally defined nonnegative solutions of the Riccati equation provided by the Hamiltonian system ensures the dissipativity and provides the way to define the optimal storage function. The existence of such solutions is analyzed in the scenarios of exponential dichotomy and weak disconjugacy, playing also with the occurrence or absence of null controllability properties.

The work is made in collaboration with Roberta Fabbri, Russell Johsnon, Sylvia Novo and Rafael Obaya.

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