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Weak disconjugacy and weak controllability for linear Hamiltonian systems

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In this talk we focus on mutual interrelations between the notions of weak disconjugacy and weak controllability for linear Hamiltonian differential systems. These notions have been used in connection with the study exponential dichotomy, nonoscillation, and dissipative control processes for these systems (e.g. Johnson et al., 2016). We provide characterizations of the weak controllability and weak disconjugacy in terms of properties of certain subspaces arising in the recently introduced theory of genera of conjoined bases for linear Hamiltonian systems. We also present new results regarding the zero value of the maximal order of abnormality of the system in terms of a weak controllability condition, or in terms of a weak disconjugacy condition when the system is nonoscillatory and satisfies the Legendre condition. The talk may be regarded as a clarification of the previous considerations in the literature about the weak disconjugacy and weak controllability for linear Hamiltonian systems (e.g. Fabbri et al., 2011, and Johnson et al., 2016).