Principal and antiprincipal solutions at infinity for nonoscillatory linear Hamiltonian systems

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In this talk we will discuss the theory of principal and antiprincipal solutions at infinity for nonoscillatory linear Hamiltonian systems. Principal solutions are in a certain sense the smallest solutions of the system at infinity. A key new ingredient is that we do not assume the complete controllability (or identical normality) of the system. We show how to define the principal solutions at infinity for this more general case and that the principal and antiprincipal solutions can have their rank equal to any integer value in an explicitly given range. The smallest rank corresponds to the unique minimal principal solution at infinity, while the largest rank corresponds to the traditional maximal (i.e. invertible) principal and antiprincipal solutions at infinity. We shall comment on some applications of the principal solutions at infinity for controllable systems in the oscillation and spectral theory and seek for such applications in the abnormal case. This talk is based on a joint work with Peter Šepitka.