EXISTENCE OF MAXIMAL SEMIDEFINITE INVARIANT SUBSPACES AND SEMIGROUP PROPERTIES OF SOME CLASSES OF ORDINARY DIFFERENTIAL OPERATORS

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Abstract. We describe sufficient conditions for the operator \( Lu = \frac{1}{g(x)} L_0 u \), with \( L_0 \) an ordinary differential operator dissipative on its domain and a function \( g \) changing its sign, to have maximal semidefinite invariant subspaces in the Krein space \( L_2, g(a,b) \) with the indefinite inner product \( [u,v] = \int_a^b g(x) u(x) \overline{v(x)} \, dx \). The semigroup properties of the restrictions of an operator to these subspaces are studied. The similarity problem of \( L \) to a selfadjoint operator is discussed.

Mathematics subject classification (2010): 47E05, 34B24, 47A15, 47B50, 46C20, 47D06.

Keywords and phrases: Dissipative operator, Krein space, invariant subspace, analytic semigroup, similarity.

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