On the operator group generated by the one–dimensional Dirac system

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Keywords: Dirac operator, summable potential, operator group.

MSC2010 codes: 34L40

In our talk, we consider the well–known differential operator — the one–dimensional Dirac operator. We define this operator on a finite interval, adding arbitrary Birkhoff–regular boundary conditions. The difference from the classical theory is that the matrix potential of the operator is assumed to be non–smooth — we will require only Lebesgue summability of the potential on the entire interval. Our main goal is to define an operator exponent (operator group). The potential is assumed to be complex, and the boundary conditions may not be self–adjoint, so that the operator is not, in general, self–adjoint. So the question of the existence of a group turns out to be non–trivial. Nevertheless, the group exists, and not only in the space L_2, but also in the scale of Sobolev spaces, as well as in the spaces L_p. The issue of estimating the growth of this group for large values of time will be considered separately. It naturally leads to questions about the localization of the spectrum and estimates of the Riesz constant.

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