Buslaeva, M. V.

Asymptotic dynamics and spectral analysis for the one-dimensional Schrödinger operator with accelerating potential. (Russian) Zbl 0599.47013

Probl. Mat. Fiz. 11, 67-77 (1986).

The one-dimensional Schrödinger operator H is considered on a semi-axis with a potential allowing the asymptotic estimate $-vx^{2\alpha} \leq v(x) \leq -v_+x^{2\alpha}$, $0 < v_+$, $1/3 < \alpha < 1$. The intertwining operator is constructed explicitly. It allows the asymptotic, for large time intervals, identification of the unitary group generated by the operator H with the shift in the function space on the axis. This result leads directly to the unitary equivalence of H and the differentiation operator on the axis. The conditions of existence of ordinary and generalized wave operators for a pair of different operators of the type H are obtained.

Reviewer: O.Dumbrajs

MSC:

47A40 Scattering theory of linear operators
47F05 General theory of partial differential operators

Keywords:

one-dimensional Schrödinger operator; asymptotic estimate; intertwining operator; unitary group; existence of ordinary and generalized wave operators