UDC 517.927

Necessary and Sufficient Conditions for the Solvability of the Inverse Problem for Sturm–Liouville Operators with a Nonintegrable Singularity Inside a Finite Interval

A. E. Fedoseev

Saratov State University, Russia, 410012, Saratov, Astrahanskaya st., 83, fedoseev_ae@mail.ru

The inverse spectral problem of recovering Sturm–Liouville operators on a finite interval with a nonintegrable Bessel-type singularity in an interior point from the given spectral data is studied. A corresponding uniqueness theorem is proved, a constructive procedure for the solution of the inverse problem is provided. Necessary and sufficient conditions for the solvability of the inverse problem are obtained.

Key words: Sturm–Liouville operators, inverse problems, nonintegrable singularity, Weyl function, spectral data.

References

1. Marchenko V. A. *Sturm–Liouville operators and applications*. Basel, Birkhüser, 1986. 367 p. (Russ. ed.: Marchenko V. A. *Operatory Shturma–Liuvillia i ikh prilozheniia*. Kiev, Naukova Dumka, 1977. 331 p.)

2. Levitan B. M. *Inverse Sturm–Liouville problems*. Utrecht, VNU, 1987, 240 p. (Russ. ed.: Levitan B. M. *Obratnye zadachi Shturma–Liuvillia*. Moscow, Nauka, 1984, 239 p.)

3. Yurko V. A. *Vvedenie v teoriiu obratnykh spektral'nykh zadach* [Introduction to the theory of inverse spectral problems]. Moscow, Fizmatlit, 1984, 384 p. (in Russian).

4. Yurko V. A. *Method of Spectral Mappings in the Inverse Problem Theory*, Inverse and Ill-posed Problems Series. Utrecht, VSP, 2002, 303 p.