

**Marchuk, G. I.; Zalesny, V. B.**

**A numerical technique for geophysical data assimilation problems using Pontryagin's principle and splitting-up method.** (English) [Zbl 0818.65057](#)

Russ. J. Numer. Anal. Math. Model. 8, No. 4, 311-326 (1993).

Summary: Formulations of the observational data assimilation problem are given and methods for its solution that constructively use conjugate equations are described. On the basis of Pontryagin's maximum principle, the initial problem of minimizing the quadratic functional, which is the difference between the solution and observational data, reduces to the spatial-temporal problem. The solution of a maximum-principle boundary value problem is constructed on the basis of the splitting-up method, which reduces a complex multidimensional problem to the sequence of problems with simpler operators.

**MSC:**

[65K10](#) Numerical optimization and variational techniques

[49M15](#) Newton-type methods

[86A05](#) Hydrology, hydrography, oceanography

[49J20](#) Existence theories for optimal control problems involving partial differential equations

Cited in **11** Documents

**Keywords:**

geophysical data; dynamic oceanology; optimal control; observational data assimilation problem; conjugate equations; Pontryagin's maximum principle; minimizing the quadratic functional; splitting-up method

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