

Beleva, Mariana

Optimal filtering of linear Wiener process observed at moments of first reaching of lines.

(English) [Zbl 0689.60045](#)

[Math. Balk., New Ser. 2, No. 2-3, 202-207 \(1988\).](#)

The author considers an optimal filter of a nonobservable Wiener process which is observed at moments of first reaching arbitrarily chosen lines. These moments form an increasing sequence. Two theorems are proved.

The first one gives the representation of the optimal filter of the process in terms of the moments of first reaching the lines, their coefficients and the distribution functions of the differences between the sequential reaching moments. The second theorem determines the distribution function used in the first theorem.

Three special cases discussed in the paper are as follows: 1. the case of horizontal lines, 2. the case of a bundle of lines passing through a given point on the axis, and 3. the case of parallel inclined lines. The first case coincides with the problem solved in *D. I. Hadziev*, Probability theory, Proc. 6th Conf., Brasov/Romania 1979, 299-306 (1981; [Zbl 0491.60041](#)).

Reviewer: [A.Swierniak](#)

MSC:

[60G35](#) Signal detection and filtering (aspects of stochastic processes)

[62M20](#) Inference from stochastic processes and prediction

[93E11](#) Filtering in stochastic control theory

Keywords:

counting process; nonobservable Wiener process; representation of the optimal filter