ON AN OPTIMAL FILTRATION PROBLEM
FOR ONE-DIMENSIONAL DIFFUSION PROCESSES

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We find a method that reduces the solution of a problem of nonlinear filtration of one-dimensional diffusion processes to the solution of a linear parabolic equation with constant diffusion coefficients whose remaining coefficients are random and depend on the trajectory of the observable process. The method consists in reducing the initial filtration problem to a simpler problem with identity diffusion matrix and subsequently reducing the solution of the parabolic Itô equation for the filtered density to solving the above-mentioned parabolic equation. In addition, the filtered densities of both problems are connected by a sufficiently simple formula.

Key words and phrases: diffusion process, optimal filtration problem, filtered density.

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