

Filtering of signals transmitted in multichannel from Chandrasekhar and Riccati recursions

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Abstract. In this paper, two recursive algorithms are proposed and compared as a solution of the least mean-squared error linear filtering problem of a wide-sense stationary scalar signal from uncertain observations perturbed by white and coloured additive noises. Considering that the state-space model of the signal is not available and that the variables modelling the uncertainty are not independent, the proposed algorithms are derived by using covariance information. The difference between both algorithms lies in the way of calculating the filtering gain: whereas, in one of them, Chandrasekhar-type difference equations are used, the other is based on Riccati-type ones. The use of the Chandrasekhar-type equations for calculating the filtering gain reduces the number of operations to perform at each iteration of the algorithm; this fact implies that the Chandrasekhar-type algorithm is more advantageous than the Riccati-type one in a computational sense. The proposed algorithms are applied to solve the filtering problem of signals transmitted in multichannel using covariance information.

AMS Classification: 62M20, 60G35