Abstract:
The problem of optimum analog receive filtering for digital signal detection and parameter estimation is considered. Here the case of a signal source with bandwidth $B_t$ and a receiver with fixed sampling rate $f_s$ is discussed under the assumption that $2B_t > f_s$. We investigate the impact of adjusting the receive bandwidth $B_r$ of the analog pre-filter, which is applied prior to the sampler, with respect to the deflection coefficient or the Fisher information measure. This reveals that the design rule $2B_r f_s$ achieve higher detection and parameter estimation performance.