

The main aim of the present study was to examine the effect of the maximum voluntary contraction (MVC) on the mean absolute value (MAV) and on the median frequency (MDF) of simulated surface electromyographic (sEMG) signals generated in a cylindrical, multilayer, volume conductor constituted by bone, muscle, fat, and skin layers and detected by the longitudinal single (LSD) and double (LDD) differential systems. The study was made for two values (5 and 10 mm) of the interelectrode distances (IED) and three values (20, 25, and 30 Hz) of the peak firing rate (PFR) of the first recruited motor unit (MU) in the case of narrow (30%) and broad (70%) recruitment ranges (RRs) of MU when the MVC level varied from 10% to 100% in steps of 10%. The results show that an increase of MVC level leads to an increase of MAV and a decrease of MDF of the simulated sEMG signals. Moreover, for the same RR of MU, the MAV values were larger for the large IED and the large PFR. However, with the MDF values, inverse results were obtained