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Feasibility of Capacitive Sensing of Surface Electromyographic Potential through Cloth

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A capacitive sensing method was developed for sensing surface electromyographic potential (sEMG) through a thin cloth. The method is based on capacitive coupling involving fabric electrodes, the cloth, and the skin of the subject. A proposed measuring device was assembled by modifying the previously developed instrument for electrocardiographic potential. Experimental results showed that sEMG obtained with the proposed system was clearly visible and showed firings synchronized with sEMG simultaneously measured with a commercial device and that the spectral powers of both sEMGs were almost identical. These results demonstrated the potential of the proposed method to measure sEMG through cloth. The method enables the discomfort due to conventional skin-to-electrode coupling to be eliminated, although the signal quality, such as the signal-to-noise ratio (S/N), is slightly decreased with the cloth barrier.

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