

Detection method for contact electrification based on electrostatic induction

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Abstract — In this study, we propose a new concept for touch sensors based on the measurement of current generated by electrostatic induction. The proposed sensor can detect the timing of contact between two objects under perfect noncontact condition. When a human body comes in contact with an object, electrostatic charge is generated in the human body due to the tribological interaction. We assume that the human body is a good conductor. As a result, an instantaneous change is observed in the electric potential of the human body. Therefore, contact can be detected by detecting the change in the electric potential of the human body. We have developed an effective technique for measuring the change in the electric potential of a human body using a noncontact electrode. Such indirect measurement is made possible by the measurement of the instantaneous current flowing through the electrode instead of the measurement of the voltage of the electrode by the conventional capacitively coupled method. This new technique requires the measurement of the electrostatic induction current generated due to changes in the electric potential of the human body.