

On anomalous asymmetric rf current of the plasma mediated electrosurgery device

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A study was conducted on the rf current flowing through the treated biological tissue during the plasma mediated electrosurgery at various experimental conditions (voltages, gases and tissue treatment speeds). An interesting result was found: in spite of installation of the blocking capacitor in the device, the asymmetric rf current which induces the dc current flowing the tissue and can cause the muscular stimulation during medical operation were observed after the symmetric current. The origin of this asymmetric current is the different value of the secondary electron emission coefficient of each material, between the electrode and the tissue. The physics revealed in this presentation is expected to provide an insight for the safety window of the plasma mediated electrosurgery device during the plasma surgical operation.