What is claimed is:

1. A clamping system, comprising:

an electrostatic clamp having a platen and a plurality of electrodes (the "embedded electrodes") embedded in the platen such that the embedded electrodes are spaced apart from an outer surface of the platen that is closest to a workpiece position so as to create an electrode-to-platen-surface-distance of 1 mm or less, wherein the embedded electrodes provide one side of a capacitor and a work piece provides another side of the capacitor in order to hold the work piece to the platen when at least some of the embedded electrodes are electrically charged; and

a high-impedance voltmeter (the "HIV") electrically connected to at least some of the embedded electrodes to measure work piece voltage.

2. The clamping system of claim 1, wherein at least some of the embedded electrodes are not electrically connected to the HIV.

3. The clamping system of claim 2, wherein the embedded electrodes that are not electrically connected to the HIV are larger than the embedded electrodes that are electrically connected to the HIV.

4. The clamping system of claim 1, wherein the HIV has an impedance equal to or exceeding 10^{16} ohms.

5. A method of clamping a work piece, comprising:

providing an electrostatic clamp having a platen and a plurality of electrodes embedded (the "embedded electrodes") in the platen such that the embedded electrodes are spaced apart from an outer surface of the platen that is closest to a workpiece position so as to create a sensor-to-platen-surface-distance of 1 mm or less;

providing a high-impedance voltmeter (the "HIV") electrically connected to at least some of the embedded electrodes;

supporting a work piece via the platen;

causing at least some of the embedded electrodes to be electrically charged so that the embedded electrodes provide one side of a capacitor and the work piece provides another side of the capacitor in order to hold the work piece relative to the platen; and

monitoring voltages of at least some of the embedded electrodes using the HIV to measure work piece voltage; and

adjusting a voltage on the work piece in response to monitoring voltages of at least some of the embedded electrodes.

6. The method of claim 5, wherein at least some of the embedded electrodes are not electrically connected to the HIV.

7. The method of claim 6, wherein the embedded electrodes that are not electrically connected to the HIV are larger than the embedded electrodes that are electrically connected to the HIV.

8. The method of claim 5, wherein the HIV has an impedance equal to or exceeding 10^{16} ohms.