## CLAIMS

What is claimed is:

1. In a plasma processing chamber having a movable lower electrode, a detection circuit arrangement comprising:

a flexible connector having a first flexible connector end, a second flexible connector end and at least a slit, wherein at least a portion of said slit is disposed in a direction parallel to a line drawn between said first flexible connector end and said second flexible connector end, said first flexible connector end is coupled to said movable lower electrode, said second flexible connector end is coupled to a component of said plasma processing chamber, wherein said flexible ~~conductor~~ connector is configured to provide a low impedance current path between said movable lower electrode and said component of said plasma processing chamber; and

means for detecting current flow through ~~connector~~ conductor material disposed on one side of said slit, said means for detecting including at least a coil wound around ~~a~~ at least said conductor material disposed on said one side of said slit and a detector circuit coupled to said coil for detecting said current flow.

2. The detection circuit arrangement of claim 1 wherein said detector circuit is configured to analyze a set of parameters collected about said current flow to determine when change to said current flow is outside a predefined threshold.

3. The detection circuit arrangement of claim 2 wherein said set of parameters includes at least one of resonance frequency and impedance.

4. The detection circuit arrangement of claim 3 wherein said flexible connector includes multiple slits, wherein said multiple slits are connected to a single detector circuit.

5. The detection circuit arrangement of claim 3 wherein said flexible connector includes multiple slits, wherein each slit of said multiple slits is connected to an individual detector circuit.

6. The detection circuit arrangement of claim 3 wherein an alternating current (AC) signal is applied to said coil.

7. The detection circuit arrangement of claim 6 wherein said AC signal is at a different frequency than a frequency associated with said current flow.

8. In a plasma processing chamber having a movable lower electrode, a detection circuit arrangement comprising:

a flexible connector having a first flexible connector end and a second flexible connector end, said first flexible connector end is coupled to said movable lower electrode, said second flexible connector end is coupled to a component of said plasma processing chamber, wherein said flexible ~~conductor~~ connector is configured to provide a low impedance current path between said movable lower electrode and said component of said plasma processing chamber; and

means for detecting current flow through said flexible connector, said means for detecting ~~including at least a coil attached to a detector circuit~~ said current flow including a detector circuit coupled to a laminated detection circuit loop that is laminated onto said flexible connector, said laminated detection circuit loop comprising a conductor that forms at least a main branch and two sub-branches, wherein said laminated detection circuit loop that includes said at least said main branch and said two sub-branches forms a single current loop.

9. The detection circuit arrangement of claim 8 wherein said means for detecting said current flow is pre-stretched to enable said means for detecting said current flow to mimic conditions of said flexible connector as said lower electrode is elevated and lowered.

~~10. The detection circuit arrangement of claim 8 wherein said means for detecting said current flow has a prong configuration.~~

~~11. The detection circuit arrangement of claim 10 wherein said prong configuration includes at least two prongs.~~

~~12~~10. The detection circuit arrangement of claim ~~10~~ 8 wherein said means for detecting said current flow includes a set of passive components, wherein said

set of passive components includes one of a set of resistors, a set of inductors, and a set of capacitors.

~~13~~11. The detection circuit arrangement of claim 8 wherein said detector circuit is configured to analyze a set of parameters collected about said current flow to determine when change in said current flow is outside a predefined threshold.

~~14~~12. The detection circuit arrangement of claim 8 wherein at least one of alternating current signal (AC) and direct current (DC) signal is ~~induced on~~ provided to said ~~coil~~ conductor.

~~15~~13. The detection circuit arrangement of claim ~~14~~ 12 wherein said at least one of said AC signal and said DC signal is at a different frequency than a frequency associated with said current flow through said flexible connector.

~~16~~14. A method for identifying discontinuity in a current path during plasma processing, comprising:

providing a plasma processing chamber having a movable lower electrode;

providing a flexible connector having a first flexible connector end and a second flexible connector end, wherein said flexible connector having at least a coil coupled to a detector circuit, wherein said coil coupled to said detector circuit is configured for at least detecting current flow through said flexible connector; and

attaching said first flexible connector end to said movable lower electrode and said second flexible connector end to a component of said plasma processing chamber, wherein said flexible ~~conductor~~ connector is configured to provide a low impedance current path between said movable lower electrode and said component of said plasma processing chamber, wherein said flexible connector includes at least a slit and said coil is wound parallel to a line drawn between said first flexible connector end and said second flexible connector end.

~~17. The method of claim 16 wherein said flexible connector includes at least a slit and said coil is wound around at least said slit, wherein at least a portion of said slit is disposed in a direction parallel to a line drawn between said first flexible connector end and said second flexible connector end.~~

~~18~~15. The method of claim ~~16~~ 14 wherein said coil coupled to said detector circuit is affixed to said flexible connector using an adhesive, wherein said coil coupled to said detector circuit is pre-stretched to enable said coil coupled to said detector circuit to mimic conditions of said flexible connector as said lower electrode is elevated and lowered.

~~19~~16. The method of claim ~~16~~ 14 further including at least collecting data about a set of parameters about said current flow and analyzing said set of parameters via said detector circuit to determine when change in said current flow is outside a predefined threshold.

~~20~~17. The method of claim ~~16~~ 14 further includes inducing at least one of alternating current (AC) signal and direct current (DC) signal on said coil, wherein said at least one of said AC signal and said DC signal is at a different frequency than a frequency associated with said current flow through said flexible connector.