What is claimed is:

1. A RF system comprising:

a first RF generator having a first digital communication port and connected to a first electrode of a load and generating a first RF signal to the first electrode;

a second RF generator having a second digital communication port and connected to a second electrode of a load and generating a second RF signal to the second electrode, wherein the first and second RF generators provide a respective RF voltage to the first and second electrodes; and

a controller for controlling the second RF generator, the controller generating a control signal to at least one of the first RF generator or the second RF generator,

wherein the first digital communication port and the second digital communication port are connected and the first RF generator and the second RF generator communicate via the first digital communication port and the second digital communication port,

wherein the second RF generator communicates a request to the first RF generator via the second digital communication port to request adjustment of the second RF signal, and the first RF generator varies a RF control signal applied to the second RF generator to adjust the second RF signal, and

wherein the first RF generator and the second RF generator operate at substantially a same frequency in accordance with a RF control signal communicated from the first RF generator to the second RF generator.

2. The RF system of claim 1 further comprising a DC power supply providing a DC rail voltage for driving a power amplifier of the second RF generator, wherein the controller varies the DC rail voltage in order to control a RF voltage at the second electrode.

3. The RF system of claim 2 wherein the controller varies a phase of the second RF signal.

4. The RF system of claim 3 wherein the controller determines a phase of the first RF signal and the phase of the second RF signal and controls a phase difference between the first RF signal and the second RF signal, wherein the controller varies the phase of the second RF signal in accordance with the phase difference.

5. The RF system of claim 1 wherein the controller varies a phase of the second RF signal.

6. The RF system of claim 5 wherein the controller determines a phase of the first RF signal and the phase of the second RF signal and determines a phase difference between the first RF signal and the second RF signal, wherein the controller varies the phase of the second RF signal in accordance with the phase difference.

7. The RF system of claim 6 wherein the first RF generator and the second RF generator provide one of a source or bias voltage to the first and second electrodes.

8. The RF system of claim 1 wherein the first RF generator and the second RF generator provide one of a source or bias voltage to the first and second electrodes.

9. The RF system of claim 1 wherein the first RF generator and the second RF generator operate in one of a continuous wave mode of operation or a pulse mode of operation.

10. The RF system of claim 9 wherein in a pulse mode of operation, the first RF generator outputs a pulse synchronization signal to the second RF generator to control pulsing of the second RF generator.

11. The RF system of claim 1, wherein the adjustment is one of amplitude or phase of the second RF signal.

12. The RF system of claim 1 wherein the second RF generator communicates a request to the first RF generator via the second digital communication port to request adjustment of pulsing of the second RF signal, and the first RF generator varies a pulse control signal applied to the second RF generator to adjust pulsing of the second RF signal.

13. The RF system of claim 12 wherein the adjustment is one of pulse repetition rate, power level, or duty cycle.

14. The RF system of claim 1 wherein the second RF generator further comprises:

a first sensor detecting at least one first electrical characteristic of the first RF signal and generating a first sensor output signal in accordance with the at least one first electrical characteristic; and

a second sensor detecting at least one second electrical characteristic of the second RF signal and generating a second sensor output signal in accordance with the at least one second electrical characteristic,

wherein the controller receives the at least one first electrical characteristic and the at least one second electrical characteristic, and the controller determines whether at least one of the second RF signal or a pulsing of a second RF signal requires adjustment and communicates a requested adjustment to the first RF generator.

15. The RF system of claim 1 wherein the second RF generator further comprises:

a first sensor detecting at least one first electrical characteristic of the first RF signal and generating a first sensor output signal in accordance with the at least one first electrical characteristic;

a power amplifier; and

a DC generator configured to output a DC voltage to the power amplifier,

wherein the controller receives the at least one first electrical characteristic, the controller determines a setpoint for the DC generator, and the controller generates a DC control signal that varies in accordance with the setpoint and communicates the DC control signal to the DC generator to vary the DC voltage.

16. The RF system of claim 15 wherein the second RF generator further comprises an inductive clamp circuit arranged in the power amplifier to return energy to one of the DC generator or a DC bus connecting the first RF generator and the second RF generator.

17. The RF system of claim 15 wherein the second RF generator further comprises

an inductive clamp circuit arranged in the power amplifier; and

a variable resistance communicating with power amplifier, the variable resistance dissipating energy communicated by the inductive clamp circuit.

18. The RF system of claim 17 wherein the controller generates a resistance control signal that varies in accordance with a desired energy to be dissipated by the variable resistance.

19. The RF system of claim 18 wherein the resistance control signal is a pulse width modulation signal or a pulse density modulation signal.

20. The RF system of claim 1 wherein the controller is configured to at least one of:

vary a phase of the second RF signal in accordance with a phase difference between the first RF signal and the second RF signal,

vary a DC rail voltage in order to control a RF voltage at the second electrode in accordance with an electrical characteristic of the second RF signal, wherein a DC power supply provides the DC rail voltage for driving a power amplifier of the second RF generator, or

vary a phase of the second RF signal and the DC rail voltage in order to control the RF voltage at the second electrode, wherein a DC power supply provides the DC rail voltage for driving the power amplifier of the second RF generator, in accordance with both the phase difference between first RF signal and the second RF signal and the electrical characteristic of the second RF signal.

21. A RF power system for supplying a first RF power to an electrode in a load, comprising:

a processor; and

a memory, wherein the memory stores instructions executable by the processor and configured to:

determine whether a voltage of the first RF power equals a predetermined power setpoint,

determine whether a phase difference between the first RF power and a second RF power equals a predetermined phase delta, and

control at least one of:

a phase of the first RF power in accordance with the phase difference between the first RF power and a second RF power,

vary a DC rail voltage in order to control a RF voltage of the first RF power in accordance with an electrical characteristic of the first RF power, or

vary a phase of the first RF power and a DC rail voltage in order to control the first RF power in accordance with both the phase difference between first RF power and the second RF power and the electrical characteristic of the first RF power.

22. The RF power system of claim 21 wherein a DC power supply provides the DC rail voltage for driving a power amplifier generating the first RF power.

23. The RF power system of claim 21 wherein the instructions are further configured to generate a request to adjust the phase of the first RF power and wherein the second RF power varies in accordance with a control signal for the first RF power.

24. The RF power system of claim 21 wherein the instructions are further configured to generate a control signal to a variable DC power supply providing the DC rail voltage.

25. The RF power system of claim 24 wherein, the DC rail voltage varies in accordance with the control.

26. A RF system comprising:

a first RF generator connected to a first electrode of a load and generating a first RF signal to the first electrode;

a second RF generator connected to a second electrode of the load and generating a second RF signal to the second electrode;

a controller for controlling the second RF generator, the controller generating a control signal to at least one of the first RF generator or the second RF generator; and

a DC power supply providing a DC rail voltage for driving a power amplifier of the second RF generator, wherein the controller varies the DC rail voltage in order to control a RF voltage at the second electrode,

wherein the first RF generator and the second RF generator operate at substantially a same RF frequency, and

wherein the controller is configured to at least one of:

vary a phase of second RF signal in accordance with a phase difference between the first RF signal and the second RF signal, or

vary a DC rail voltage to control a RF voltage at the second electrode in accordance with an electrical characteristic of the second RF signal, wherein a DC power supply provides the DC rail voltage for driving a power amplifier of the second RF generator, or

vary a phase of the second RF signal and a DC rail voltage to control the RF voltage at the second electrode, wherein a DC power supply provides the DC rail voltage for driving the power amplifier of the second RF generator, in accordance with both the phase difference between first RF signal and the second RF signal and the electrical characteristic of the second RF signal.

27. The RF system of claim 26 wherein the first RF generator and the second RF generator provide one of a source or bias voltage to the first and second electrodes.

28. The RF system of claim 26 wherein the first RF generator and the second RF generator operate in one of a continuous wave mode of operation or a pulse mode of operation.

29. The RF system of claim 28 wherein in a pulse mode of operation, the first RF generator outputs a pulse synchronization signal to the second RF generator to control pulsing of the second RF generator.

30. The RF system of claim 26 further wherein:

the first RF generator includes a first digital communication port; and

the second RF generator includes a second digital communication port,

wherein the first digital communication port and the second digital communication port are connected and the first RF generator and the second RF generator communicate via the first digital communication port and the second digital communication port.

31. The RF system of claim 30 wherein the second RF generator communicates a request to the first RF generator via the second digital communication port to request adjustment of the second RF signal, and the first RF generator varies a RF control signal applied to the second RF generator to adjust the second RF signal.

32. The RF system of claim 31, wherein the adjustment is one of amplitude or phase of the second RF signal.

33. The RF system of claim 30 wherein the second RF generator communicates a request to the first RF generator via the second digital communication port to request adjustment of pulsing of the second RF signal, and the first RF generator varies a pulse control signal applied to the second RF generator to adjust pulsing of the second RF signal.

34. The RF system of claim 33 wherein the adjustment is one of pulse repetition rate, power level, or duty cycle.

35. The RF system of claim 26 wherein the second RF generator further comprises:

a first sensor detecting at least one first electrical characteristic of the first RF signal and generating a first sensor output signal in accordance with the at least one first electrical characteristic; and

a second sensor detecting at least one second electrical characteristic of the second RF signal and generating a second sensor output signal in accordance with the at least one second electrical characteristic,

wherein the controller receives the at least one first electrical characteristic and the at least one second electrical characteristic, and the controller determines whether at least one of the second RF signal or a pulsing of a second RF signal requires adjustment and communicates a requested adjustment to the first RF generator.

36. The RF system of claim 26 wherein the second RF generator further comprises:

a first sensor detecting at least one first electrical characteristic of the first RF signal and generating a first sensor output signal in accordance with the at least one first electrical characteristic;

a power amplifier; and

a DC generator configured to output a DC voltage to the power amplifier,

wherein the controller receives the at least one first electrical characteristic, the controller determines a setpoint for the DC generator, and the controller generates a DC control signal that varies in accordance with the setpoint and communicates the DC control signal to the DC generator to vary the DC voltage.

37. The RF system of claim 26 wherein the second RF generator further comprises:

an inductive clamp circuit arranged in the power amplifier; and

a variable resistance communicating with power amplifier, the variable resistance dissipating energy communicated by the inductive clamp circuit.

38. The RF system of claim 37 wherein the controller generates a resistance control signal that varies in accordance with a desired energy to be dissipated by the variable resistance.

39. The RF system of claim 38 wherein the resistance control signal is a pulse width modulation signal or a pulse density modulation signal.

40. The RF system of claim 26 wherein the second RF generator further comprises an inductive clamp circuit arranged in the power amplifier to return energy to one of the DC generator or a DC bus connecting the first RF generator and the second RF generator.

41. A method of operating a RF power system, the method comprising:

generating a first RF signal applied to a first electrode of a load;

generating a second RF signal applied to a second electrode of the load;

providing a DC rail voltage for driving a power amplifier generating the second RF signal and varying the DC rail voltage in order to control a RF voltage at the second electrode; and

at least one of:

varying a phase of the second RF signal in accordance with a phase difference between the first RF signal and the second RF signal,

varying a DC rail voltage to control a RF voltage at the second electrode in accordance with an electrical characteristic of the second RF signal, wherein the DC rail voltage drives a power amplifier generating the second RF signal, or

varying a phase of the second RF signal and the DC rail voltage in order to control the RF voltage at the second electrode, wherein the DC rail voltage powers the power amplifier, in accordance with both the phase difference between first RF signal and the second RF signal and the electrical characteristic of the second RF signal.

42. The method of claim 41 further comprising generating the second RF signal in one of a continuous wave mode of operation or a pulse mode of operation.

43. The method of claim 41 further comprising pulsing the second RF signal in accordance with a pulse control signal to adjust pulsing of the second RF signal.

44. The method of claim 41 further comprising:

detecting at least one first electrical characteristic of the first RF signal and generating a first sensor output signal in accordance with the at least one first electrical characteristic;

detecting at least one second electrical characteristic of the second RF signal and generating a second sensor output signal in accordance with the at least one second electrical characteristic; and

determining whether at least one of the second RF signal or a pulsing of a second RF signal requires adjustment and communicating a requested adjustment to a first RF generator.

45. The method of claim 44 further comprising generating a DC control signal that varies in accordance with a setpoint and communicating the DC control signal to vary the DC rail voltage.

46. The method of claim 41 further comprising:

providing an inductive clamp circuit arranged in the power amplifier generating the second RF signal; and

providing a variable resistance communicating with power amplifier, the variable resistance dissipating energy communicated by the inductive clamp circuit.

47. The method of claim 41 further comprising providing an inductive clamp circuit arranged in the power amplifier generating the second RF signal to return energy to one of a source of the DC rail voltage.