CLAIMS

1. A wireless electric field power transmission system comprising:

a transmitter comprising a transmit resonator and a transmit capacitive balun; and

at least one receiver comprising a receive resonator and a receive capacitive balun, wherein, via resonant electric field coupling:

the transmit capacitive balun is configured to transfer power to the transmit resonator,

in response, the transmit resonator is configured to transfer power to the receive resonator, and

the receive capacitive balun is configured to extract power from the receive resonator.

2. A method of wirelessly transferring power, the method comprising: delivering power from a source to a transmit resonator via a transmit capacitive balun via electric field coupling;

in response, transferring power from the transmit resonator to a receive resonator via electric field coupling; and

extracting power from the receive resonator via a receive capacitive balun via electric field coupling.

3. A transmitter for wirelessly transferring power, the transmitter comprising:

a capacitive balun configured to receive an alternating signal and in response generate an electric field; and

a transmit resonator, responsive to the electric field generated by the capacitive balun, configured to resonate with the capacitive balun and generate an electric field, wherein the capacitive balun and the transmit resonator are configured to transfer power to a receiver via resonant electric field coupling.

4. The transmitter of claim 3, wherein the transmit resonator comprises laterally spaced electrodes interconnected by a series inductor.

5. The transmitter of claim 4, wherein said capacitive balun comprises laterally spaced conductive elements, each conductive element being proximate to and spaced from at least one respective electrode.

6. The transmitter of claim 5, wherein the conductive elements and electrodes are in substantial alignment so that major faces of the conductive elements and electrodes face one another.

7. The transmitter of claim 5, wherein the conductive elements and electrodes are generally planar.

8. The transmitter of claim 5, wherein the conductive elements and electrodes are curved, angled and/or textured.

9. The transmitter of claim 5, wherein the conductive elements and electrodes have substantially similar dimensions.

10. The transmitter of claim 5, wherein the conductive elements and electrodes are of different dimensions and/or different geometries.

11. The transmitter of claim 3, further comprising a power inverter connected across the capacitive balun, said power inverter configured to output the alternating signal that excites the capacitive balun.

12. The transmitter of claim 3, further comprising a source configured to generate the alternating signal that excites the capacitive balun.

13. The transmitter of claim 3, wherein the alternating signal is a radio frequency (RF) signal.

14. A receiver for wirelessly receiving power, the receiver comprising:

a receive resonator; and

a capacitive balun capacitively coupled to the receive resonator, wherein the receive resonator and the capacitive balun are configured to resonate in response to a generated electric field, and wherein the capacitive balun is configured to extract power via resonant electric field coupling and to output an alternating signal in response to resonance of the receive resonator and the capacitive balun.

15. The receiver of claim 14, wherein the receive resonator comprises laterally spaced electrodes interconnected by a series inductor.

16. The receiver of claim 15, wherein said capacitive balun comprises laterally spaced conductive elements, each capacitive element being proximate to and spaced from at least one respective electrode.

17. The receiver of claim 16, wherein the conductive elements and electrodes are in substantial alignment so that major faces of the conductive elements and electrodes face one another.

18. The receiver of claim 16, wherein the conductive elements and electrodes are generally planar.

19. The receiver of claim 16, wherein the conductive elements and electrodes are curved, angled and/or textured.

20. The receiver of claim 16, wherein the conductive elements and electrodes have substantially similar dimensions.

21. The receiver of claim 16, wherein the conductive elements and electrodes are of different dimensions and/or different geometries.

22. The receiver of claim 14, further comprising a rectifier configured to convert the alternating signal to a direct current signal.

23. The receiver of claim 22, further comprising a regulator configured to regulate the direct current signal.