CLAIMS

1. A planar stator configured to be disposed within an axial gap between a first portion of a rotor and a second portion of the rotor of ~~for~~ an axial flux machine, the~~having a~~ rotor including ~~that includes~~ one or more magnets that generate first magnetic flux, generally parallel to an axis of rotation of the rotor, in an active region within the axial~~a~~ gap ~~of the axial flux machine~~, the planar stator comprising:

a first discrete stator segment including a first printed circuit board (PCB) substrate;

at least first and second terminals supported by the first PCB substrate, the first and second terminals adapted to be connected to first circuitry external to the planar stator;~~at least first, second, third, and fourth terminals, each adapted to be connected to circuitry external to the planar stator;~~

at least a ~~one~~ first winding supported by the first PCB substrate, the first winding arranged to be positioned within the active region, the ~~at least one~~ first winding having first and second ends electrically connected to the first and second terminals, respectively, wherein an electrical characteristic between the first and second terminals, as measured when the first and second terminals are not connected to any~~the~~ circuitry external to the first discrete stator segment, has a first value;

a second discrete stator segment different from the first discrete stator segment, the second discrete stator segment including a second PCB substrate;

at least third and fourth terminals supported by the second PCB substrate, the third and fourth terminals adapted to be connected to second circuitry external to the planar stator; and~~and~~

at least a ~~one~~ second winding supported by the second PCB substrate, the second winding arranged to be positioned within the active region, the ~~at least one~~ second winding being electrically isolated from the ~~at least one~~ first winding and having third and fourth ends electrically connected to the third and fourth terminals, respectively, wherein the electrical characteristic between the third and fourth terminals, as measured when the third and fourth terminals are not connected to any ~~the~~ circuitry external to the first discrete stator segment, has a second value which is substantially different than the first value.

2. The planar stator of claim 1, wherein:

~~the at least one first winding is disposed on a first stator segment, and~~

~~the at least one second winding is disposed on a second stator segment that~~ the second stator segment is angularly offset from, and non-overlapping with, the first stator segment with respect to the axis of rotation.

3. The planar stator of claim 2, in combination with the first circuitry, and wherein:

~~the at least one first winding includes a first winding and at least one~~ an additional winding is supported by the first PCB substrate;

the circuitry includes a power source;

the first winding is configured to support a first phase from the power source; and

the ~~at least one~~ additional winding is configured to support ~~at least one~~ a second ~~additional~~ phase from the power source so that a peak value of a second magnetic flux generated by a combination of the first winding and the ~~at least one~~ additional winding follows an arcuate path with respect to the axis of rotation.

4. The planar stator of claim 1, wherein the electrical characteristic is resistance, and a first resistance between the first and second terminals, as measured when the first and second terminals are not connected to any~~the~~ circuitry external to the first stator, is at least fifty percent greater than a second resistance between the third and fourth terminals, as measured when the third and fourth terminals are not connected to any~~the~~ circuitry external to the second stator segment.

5. The planar stator of claim 1, wherein the electrical characteristic is flux linkage with the first magnetic flux~~, and a first flux linkage between the at least one first winding and the first magnetic flux, as seen between the first and second terminals, is at least fifty percent greater than a second flux linkage between the at least one second winding and the first magnetic flux, as seen between the third and fourth terminals~~.

6. The planar stator of claim 5, wherein:

a first flux linkage between the at least one first winding and the first magnetic flux, as seen between the first and second terminals, is at least fifty percent greater than a second flux linkage between the at least one second winding and the first magnetic flux, as seen between the third and fourth terminals.

7. The planar stator of claim 5, wherein:

the first winding includes a first number of turns; and

the second winding includes a second number of turns that is different than the first number of turns.

8~~6~~. The planar stator of claim 1, in combination with the first circuitry, and wherein the first circuitry includes a first controller configured to selectively couple the first and second terminals to a power source such that, during at least a first mode of operation of the axial flux machine, the ~~at least one~~ first winding generates a second magnetic flux generally parallel to the axis of rotation.

9~~7~~. The ~~planar stator~~combination of claim 8~~6~~, in further combination with the second circuitry, and wherein the second circuitry further includes a second controller configured to selectively couple the third and fourth terminals to a power source such that, during at least a second mode of operation of the axial flux machine, the ~~at least one~~ second winding generates a third magnetic flux generally parallel to the axis of rotation.

10~~8~~. The ~~planar stator~~combination of claim 8~~6~~, further comprising:

at least one switch configured to be selectively closed to establish an electrical connection between the third and fourth terminals at a time that the ~~at least one~~ second winding is not coupled to an external power source.

11~~9~~. The ~~planar stator~~combination of claim 10~~8~~, wherein the at least one switch is configured to establish the electrical connection between the third and fourth terminals via at least one dissipative element.

12~~10~~. The combination ~~planar stator~~ of claim 11~~9~~, wherein the second circuitry further comprises a second controller configured to cause the at least one switch to be modulated to control a time average conductivity between the third and fourth terminals.

13~~11~~. The ~~planar stator~~combination of claim 8~~6~~, wherein the second circuitry further comprises a second controller configured to selectively couple the third and fourth terminals to an energy storage element such that, during at least a second mode of operation of the axial

flux machine, the energy storage element receives power generated by the second winding in response to rotation of the rotor.

1412. The planar stator of claim 1, in combination with the circuitry, and wherein the first circuitry comprises a first controller configured to selectively couple the first and second terminals to an energy storage element such that, during at least a first mode of operation of the axial flux machine, the energy storage element receives power generated by the first winding in response to rotation of the rotor.

1513. The ~~planar stator~~combination of claim 1412, in further combination with the second circuitry, and wherein the circuitry further comprises a second controller configured to selectively couple the third and fourth terminals to an energy storage element such that, during at least a second mode of operation of the axial flux machine, the energy storage element receives power generated by the second winding in response to rotation of the rotor.

1614. The ~~planar stator~~combination of claim 1412, further comprising:

at least one switch configured to be selectively closed to establish an electrical connection between the third and fourth terminals at a time that the ~~at least one~~ second winding is not coupled to an external power source.

1715. The ~~planar stator~~combination of claim 1614, wherein the at least one switch is configured to establish the electrical connection between the third and fourth terminals via at least one dissipative element.

1816. The ~~planar stator~~combination of claim 1715, in further combination with the second circuitry, and wherein the second circuitry further comprises a second controller configured to cause the at least one switch to be modulated to control a time average conductivity between the ~~first and second~~third and fourth terminals.

19. The planar stator of claim 1, in combination with the rotor.

20. The combination of claim 19, wherein:

the one or more magnets include at least one first magnet included on the first portion of the rotor and at least one second magnet included on the second portion of the rotor; and the axial gap is located between the at least one first magnet and the at least one second magnet.

21. The combination of claim 19, in further combination with the first circuitry and the second circuitry.

22. The combination of claim 21, wherein the first circuitry includes a first controller configured to selectively couple the first and second terminals to a power source such that, during at least a first mode of operation of the axial flux machine, the first winding generates a second magnetic flux generally parallel to the axis of rotation.

23. The combination of claim 22, wherein the second circuitry further includes a second controller configured to selectively couple the third and fourth terminals to a power source such that, during at least a second mode of operation of the axial flux machine, the second winding generates a third magnetic flux generally parallel to the axis of rotation.

24. The combination of claim 22, further comprising:

at least one switch configured to be selectively closed to establish an electrical connection between the third and fourth terminals at a time that the second winding is not coupled to an external power source.

25. The combination of claim 22, wherein the second circuitry further comprises a second controller configured to selectively couple the third and fourth terminals to an energy storage element such that, during at least a second mode of operation of the axial flux machine, the energy storage element receives power generated by the second winding in response to rotation of the rotor.

26. The combination of claim 21, wherein the first circuitry comprises a first controller configured to selectively couple the first and second terminals to an energy storage element such that, during at least a first mode of operation of the axial flux machine, the energy

storage element receives power generated by the first winding in response to rotation of the rotor.

27. The combination of claim 26, wherein the second circuitry further comprises a second controller configured to selectively couple the third and fourth terminals to an energy storage element such that, during at least a second mode of operation of the axial flux machine, the energy storage element receives power generated by the second winding in response to rotation of the rotor.

28. The planar stator of claim 1, wherein:

the first winding includes a first number of turns; and

the second winding includes a second number of turns that is different than the first number of turns.

~~17. A planar stator for an axial flux machine having a rotor that includes one or more magnets that generate first magnetic flux, generally parallel to an axis of rotation of the rotor, in an active region within a gap of the axial flux machine, the planar stator comprising:~~

~~a first conductive sheet arranged to be positioned within the active region so that generation of eddy currents within the first conductive sheet imposes a drag force on the rotor; and~~

~~at least a first winding arranged to be positioned within the active region, the first winding having at least first and second terminals electrically connected to respective ends of the first winding.~~

~~18. The planar stator of claim 17, further comprising a controller configured to selectively couple the first and second terminals to a power source such that, during at least a first mode of operation of the axial flux machine, the first winding generates second magnetic flux generally parallel to the axis of rotation.~~

~~19. The planar stator of claim 17, further comprising a controller configured to selectively couple the first and second terminals to an energy storage element such that, during at least a first mode of operation of the axial flux machine, the energy storage element receives power generated by the first winding in response to rotation of the rotor.~~

~~20. The planar stator of claim 17, further comprising:~~

~~at least one switch configured to be selectively closed to establish an electrical connection between the first and second terminals at a time that the first winding is not coupled to an external power source.~~

~~21. The planar stator of claim 20, wherein the at least one switch is configured to selectively establish the electrical connection between the first and second terminals via at least one dissipative element.~~

~~22. The planar stator of claim 21, further comprising a controller configured to cause the at least one switch to be modulated to control a time average conductivity between the first and second terminals.~~

~~23. A planar stator for an axial flux machine having a rotor that includes one or more magnets that generate first magnetic flux, generally parallel to an axis of rotation of the rotor, in an active region within a gap of the axial flux machine, the planar stator comprising:~~

~~at least a first winding arranged to be positioned within the active region, the first winding having at least first and second terminals electrically connected to respective ends of the first winding; and~~

~~at least one switch configured to be selectively closed to establish an electrical connection between the first and second terminals at a time that the first winding is not coupled to an external power source.~~

~~24. The planar stator of claim 23, wherein the at least one switch is further configured to establish the electrical connection between the first and second terminals via at least one dissipative component.~~

~~25. The planar stator of claim 24, further comprising a controller configured to cause the at least one switch to be modulated to control a time average conductivity between the first and second terminals.~~