WHAT IS CLAIMED IS:

1. A method of controlling an optical system, the method comprising:

accessing a measured value of a property of a particular pulse of a pulsed light beam emitted from the optical system, the property being related to an amount of coherence of the light beam;

comparing the measured value of the property of the light beam to a target value of the property;

determining whether to generate a control signal based on the comparison; and

if a control signal is generated based on the comparison, adjusting the amount of coherence in the light beam by modifying an aspect of the optical system based on the control signal to reduce an amount of coherence of a pulse that is subsequent to the particular pulse; and

determining an operating condition of the optical system, the operating condition being associated with one or more operating parameters; and

if a control signal is not generated based on the comparison, declaring the measured value of the property of the light beam as a desired value of the property for the determined operating condition.

2. The method of claim 1, wherein the property of the light beam comprises a divergence of the light beam.

3. The method of claim 1, wherein the divergence of the light beam is measured outside of the optical system.

4. The method of claim 1, wherein the pulse that is subsequent to the particular pulse is a pulse that immediately follows the particular pulse.

5. The method of claim 1, wherein adjusting the amount of coherence in the light beam by modifying the value of the property of the light beam based on the control signal comprises applying the control signal to an optical element of the optical system, the optical element comprising an optical surface that interacts with the light beam in the optical system to at least partially determine the value of the property of the light beam emitted from the

optical system, the application of the control signal being sufficient to move the optical surface.

6. The method of claim 5, wherein the application of the control signal being sufficient to move the optical surface comprises the application of the control signal being sufficient to change the shape of the optical surface, change the position of the optical surface, change the angle of the optical surface relative to a direction of propagation of the pulsed light beam, or change a curvature of the optical surface.

7. The method of claim 5, wherein the optical surface comprises a plurality of portions, and application of the control signal is sufficient to move at least one of the plurality of portions of the optical surface relative to at least one of the other portions.

8. The method of claim 1, wherein declaring the measured value of the property of the light beam as a desired value of the property for the determined operating condition comprises storing data comprising the measured value in association with the operating parameters of the operating condition.

9. The method of claim 8, wherein the operating parameters comprise one or more of a pressure of a gain medium of the optical system, a temperature of a gain medium of the optical system, a repetition rate of the light beam emitted from the optical system, and an amount of force applied to an optical element comprising an optical surface that interacts with the light beam in the optical system to at least partially determine the value of the property of the light beam emitted from the optical system.

10. The method of claim 9, further comprising:

receiving an indication of a change in the operating condition of the optical system to a current operating condition;

determining the desired value of the property for the current operating condition from the stored data; and

setting the target value to the determined desired value.

11. The method of claim 10, wherein the indication of a change in the operating condition of the optical system comprises an indication of a change in the repetition rate of the light beam emitted from the optical system to a new repetition rate, and

the indication of the change in the repetition rate is received from lithography exposure apparatus that receives the light beam from the optical system.

12. The method of claim 1, wherein accessing a measured value of a property of a light beam comprises measuring the value of the property of the light beam at a first time, and further comprising:

measuring the value of the property of the light beam at a second time, the second time occurring after the first time and after adjusting the amount of coherence in the light beam;

comparing the value of the property of the light beam at the second time to the target value; and

determining whether to generate a second control signal based on the comparison.

13. A method of controlling an optical system, the method comprising:

obtaining a value of a property of an optical beam emitted from an optical system at a plurality of operating conditions, the obtained value of the property being associated with an amount of coherence in the optical beam, and each of the operating conditions being associated with one or more operating parameters and status information related to an optical element, the optical element comprising an optical surface that interacts with the light beam to at least partially determine the obtained value of the property of the light beam;

storing the obtained value of the property and the status information related to the optical element for each operating condition;

operating the optical system at a current operating condition, the current operating condition being associated with current values of one or more of the operating parameters and a current status information related to the optical element;

receiving an indication of a change in the current operating condition of the optical system, the indication of a change comprising a new value of one or more of the operating parameters;

determining status information related to the optical element associated with the new value from the stored data; and

applying a command signal based on the determined status information to the optical element.

14. The method of claim 13, wherein the obtained value of the property of the optical beam is associated with an acceptable amount of coherence in the optical beam for each of the plurality of operating conditions, and further comprising:

obtaining another value of the property of the light beam by measuring the value of the property of the light beam after apply the determined status information to the optical element;

comparing the another value to the obtained value of the property associated with the new value of the one or more operating parameters; and

determining whether the another value of the property is acceptable based on the comparison.

15. The method of claim 14, wherein the status information and the determined status information comprise an amount of force applied to the optical element, and further comprising:

if the another value of the property is not acceptable, determining a third amount of force based on the new force and a pre-determined constant; and

applying the third amount of force to the optical element.

16. The method of claim 13, wherein the status information related to the optical element comprises a position of the surface of the optical element.

17. The method of claim 13, wherein the status information related to the optical element comprises an amount of force applied to the optical element, the force being sufficient to determine a position of the surface of the optical element.

18. A system for a light source, the system comprising:

an optical coupler;

a first optical system comprising a first optical element;

a second optical system comprising a second optical element; and

a gain medium between the first optical system and the second optical system, wherein

the first optical element, the second optical element, and the optical coupler define a closed path, at least a portion of the closed path passing through the gain medium, and

one or more of the first optical element and the second optical element comprise an optically reflective surface positioned to interact with a light beam that propagates on the closed path, the surface comprising a plurality of portions, at least one of the portions having a surface profile that is different from the surface profiles of the other segments.

19. The system of claim 18, wherein the first optical element comprises the surface comprising a plurality of portions, at least one of the portions comprising a mirror and at least one of the portions comprising a grating.

20. The system of claim 18, wherein the portions are adjacent to each other, and a flexible member is between any two adjacent portions such that at least one portion is movable relative to an adjacent portion.

21. The system of claim 20, wherein any portion is movable relative to an adjacent portion.

22. The system of claim 20, wherein the surface profile of a portion is determined by one or more of a radius of curvature and a surface characteristic of the portion.

23. A system for a light source, the system comprising:

an optical coupler;

a first optical system comprising a first reflective optical element;

a second optical system comprising a second reflective optical element; and

a gain medium between the first optical system and the second optical system, wherein

the first reflective optical element, the second reflective optical element, and the optical coupler define a closed path, at least a portion of the closed path passing through the gain medium,

the second reflective optical element comprises a plurality of distinct reflective surfaces, a first of the distinct reflective surfaces positioned to receive a light beam from the gain medium and to reflect the light beam to a second of the distinct reflective surfaces, the second of the distinct reflective surfaces being positioned to

receive the light beam from the first distinct reflective surface and to reflect the light beam into the gain medium, and

at least one of the distinct reflective surfaces being one or more of physically separated from the other reflective surfaces and movable relative to the other reflective surfaces.

24. The system of claim 23, wherein at least one of the distinct reflective surfaces of the second optical element is movable relative to the other reflective surfaces, and the second optical system further comprises an actuator coupled to the at least one movable reflective surface, the actuator being configured to cause the movable reflective surface to move in response to a command signal.

25. A system comprising:

an optical system configured to amplify a pulsed optical beam, the pulsed optical beam having a repetition rate, the optical system comprising:

an optical coupler;

a first optical element;

a gain medium; and

a second optical element, the gain medium being between the first optical element and the second optical element, and the first optical element, the second optical element, and the optical coupler defining a closed path that passes through the gain medium;

a lithography exposure apparatus configured to receive the amplified pulsed optical beam; and

a control system coupled to the optical system and the lithography exposure apparatus, the control system configured to:

receive a request to change the repetition rate of the pulsed optical beam from a first repetition rate to a second repetition rate,

determine a value of property of the pulsed optical beam at the second repetition rate,

determine whether the value of the property is acceptable, and

if the value of the property is not acceptable, generate a command signal based on the determined value of the property, and provide the command signal to the optical system, the command signal being sufficient to physically modify a

controllable optical element that interacts with light that propagates on the closed path of the optical system.

26. The system of claim 25, wherein the value of the property of the pulsed optical beam is a measure of coherence of one or more pulses of the pulsed optical beam.

27. The system of claim 25, wherein the control system is further configured to determine whether the value of the property is acceptable after providing the command signal to the optical system.

28. The system of claim 26, wherein determining a value of the property of the pulsed optical beam at the second repetition rate comprises accessing a value of an amount of force applied to the controllable optical element, and wherein providing the command signal to the controllable optical element comprises applying a different amount of force to the controllable optical element.

29. The system of claim 26, wherein determining a value of the property of the pulsed optical beam at the second repetition rate comprises measuring a divergence of the pulsed optical beam when the optical system operates at the second repetition rate.

30. The system of claim 26, wherein determining a value of the property of the pulsed optical beam at the second repetition rate comprises accessing a value of the property of the pulsed optical beam stored in an electronic storage.

31. The system of claim 30, wherein the value of the property of the pulsed optical beam stored in an electronic storage comprises a value measured previously and while the optical system operated at the second repetition rate.

32. The system of claim 25, wherein the request to change the repetition rate is received from the lithography exposure apparatus.

33. The system of claim 25, wherein the control system further comprises an operator interface, the operator interface being configured to allow operator interaction with the

lithography exposure apparatus, and the request to change the repetition rate is received from the operator interface.

34. The system of claim 25, wherein the controllable optical element is one or more of the first optical element and the second optical element.

35. A method of controlling an optical system, the method comprising:

accessing a measured value of a property of a particular pulse of a pulsed light beam emitted from the optical system, the property being related to an amount of coherence of the light beam;

comparing the measured value of the property of the light beam to a target value of the property;

determining whether to generate a control signal based on the comparison; and

if a control signal is generated based on the comparison, adjusting the amount of coherence in the light beam by modifying an aspect of the optical system based on the control signal to reduce an amount of coherence of a pulse that is subsequent to the particular pulse, wherein

adjusting the amount of coherence in the light beam by modifying the value of the property of the light beam based on the control signal comprises applying the control signal to an optical element of the optical system, the optical element comprising an optical surface that interacts with the light beam in the optical system to at least partially determine the value of the property of the light beam emitted from the optical system, the application of the control signal being sufficient to move the optical surface, and

the optical surface comprises a plurality of portions, and the application of the control signal is sufficient to move at least one of the plurality of portions of the optical surface relative to at least one of the other portions.