WHAT IS CLAIMED IS:

1. A method for determining a characteristic of a wafer, comprising:

generating output responsive to light from the wafer using an inspection system, wherein the output comprises first output corresponding to defects on the wafer and second output that does not correspond to the defects; and

determining the characteristic of the wafer using the second output.

2. The method of claim 1, wherein the light from the wafer comprises diffusely scattered light.

3. The method of claim 1, wherein said generating comprises illuminating the wafer with light produced by a laser.

4. The method of claim 1, wherein said generating comprises scanning light across the wafer and generating the output across the wafer.

5. The method of claim 1, wherein said generating comprises generating the output across substantially an entire surface of the wafer.

6. The method of claim 1, wherein said generating comprises generating the output across substantially an entire surface of the wafer, and wherein said determining comprises determining the characteristic using the second output generated across substantially the entire surface of the wafer.

7. The method of claim 1, wherein said determining comprises determining the characteristic of the wafer using the second output and a predetermined correlation between the second output and the characteristic.

8. The method of claim 1, wherein said determining comprises determining a value for the second output across an area on the wafer and determining the characteristic from the value.

9. The method of claim 1, wherein the characteristic is an average characteristic across an area on the wafer.

10. The method of claim 1, wherein said determining comprises determining variation in the second output across the wafer and determining the characteristic from the variation.

11. The method of claim 1, wherein said determining comprises generating a two-dimensional map of the second output across substantially an entire surface of the wafer and determining the characteristic from the two-dimensional map.

12. The method of claim 1, wherein said determining comprises determining a value for the second output across different areas on the wafer and determining the characteristic for the different areas using the values.

13. The method of claim 1, wherein said determining comprises determining a single value of the characteristic for different areas on the wafer, and wherein each of the different areas is larger than an area of a patterned feature on the wafer.

14. The method of claim 1, wherein said generating comprising generating the output using multiple channels of the inspection system, wherein said determining comprises determining the characteristic using the second output generated by one of the multiple channels, and wherein the method further comprises determining a different characteristic of the wafer using the second output generated by another of the multiple channels.

15. The method of claim 1, further comprising performing statistical process control using the characteristic.

16. The method of claim 1, further comprising performing inline monitoring of a semiconductor fabrication process using the characteristic to detect excursions in the semiconductor fabrication process.

17. The method of claim 1, further comprising determining a standard deviation of the second output for different areas on the wafer and determining if the standard deviations indicate an excursion in a process used to form the wafer.

18. The method of claim 1, further comprising determining variation in the second output across the wafer and determining if the variation is associated with a signature of a process tool used to form the wafer.

19. The method of claim 1, further comprising generating a two-dimensional map of the second output across substantially an entire surface of the wafer, determining if an abnormal pattern is present in the two-dimensional map, and if an abnormal pattern is present, determining if the abnormal pattern corresponds to an excursion in a process used to form the wafer.

20. The method of claim 1, wherein the wafer comprises an unpatterned wafer or a patterned wafer.

21. The method of claim 1, wherein the characteristic comprises roughness, reflectivity, thickness, thickness uniformity, polish uniformity, resistivity, or grain size.

22. The method of claim 1, further comprising detecting the defects on the wafer using the output.

23. A computer-implemented method for determining a characteristic of a wafer, comprising:

acquiring output responsive to light from the wafer generated by an inspection system, wherein the output comprises first output corresponding to

defects on the wafer and second output that does not correspond to the defects; and

determining the characteristic of the wafer using the second output.

24. A system configured to determine a characteristic of a wafer, comprising:

an inspection subsystem configured to illuminate the wafer and to generate output responsive to light from the wafer, wherein the output comprises first output corresponding to defects on the wafer and second output that does not correspond to the defects; and

a processor configured to determine the characteristic of the wafer using the second output.

CLAIMS

1. A method for determining a characteristic of a wafer, comprising:

generating output responsive to light from the wafer using an inspection system, wherein the output comprises first output corresponding to defects on the water and second output that does not correspond to the defects, and wherein the first and second output are generated by the same detector; and

determining a value for the characteristic of the wafer using the second output and not the first output, wherein said determining comprises determining the value for the characteristic using a predetermined correlation between the second output and the characteristic, wherein the characteristic is a non-defect related characteristic of the wafer that can be measured using a metrology tool, and wherein the characteristic is a physical quantity of the wafer.

2. The method of claim **1**, wherein the light from the wafer comprises diffusely scattered light.

3. The method of claim **1**, wherein said generating comprises illuminating the wafer with light produced by a laser.

4. The method of claim **1**, wherein said generating comprises scanning light across the wafer and generating the output across the wafer.

5. The method of claim **1**, wherein said generating comprises generating the output across substantially an entire surface of the wafer.

6. The method of claim **1**, wherein said generating comprises generating the output across substantially an entire

surface of the wafer, and wherein said determining further comprises determining the value for the characteristic using the second output generated across substantially the entire surface of the wafer.

7. The method of claim **1**, wherein said determining further comprises determining a value for the second output across an area on the wafer and determining the value for the characteristic from the value for the second output.

8. The method of claim **1**, wherein the characteristic is an average characteristic across an area on the wafer.

9. The method of claim **1**, wherein said determining further comprises determining variation in the second output across the wafer and determining the value for the characteristic from the variation.

10. The method of claim **1**, wherein said determining further comprises generating a two-dimensional map of the second output across substantially an entire surface of the wafer and determining the value for the characteristic from the two-dimensional map.

11. The method of claim **1**, wherein said determining further comprises determining a value for the second output across different areas on the wafer and determining the value for the characteristic for the different areas using the values for the second output.

12. The method of claim **1**, wherein said determining further comprises determining a single value of the characteristic for different areas on the wafer, and wherein each of the different areas is larger than an area of a patterned feature on the wafer.

13. The method of claim **1**, wherein said generating comprises generating the output using multiple channels of the inspection system, wherein said determining further comprises determining the value for the characteristic using the

second output generated by one of the multiple channels, and wherein the method further comprises determining a different characteristic of the wafer using the second output generated by another of the multiple channels.

14. The method of claim **1**, further comprising performing statistical process control using the characteristic.

15. The method of claim **1**, further comprising performing inline monitoring of a semiconductor fabrication process using the characteristic to detect excursions in the semiconductor fabrication process.

16. The method of claim **1**, further comprising determining a standard deviation of the second output for different areas on the wafer and determining if the standard deviations indicate an excursion in a process used to form the wafer.

17. The method of claim **1**, further comprising determining variation in the second output across the wafer and determining if the variation is associated with a signature of a process tool used to form the wafer.

18. The method of claim **1**, further comprising generating a two-dimensional map of the second output across substantially an entire surface of the wafer, determining if an abnormal pattern is present in the two-dimensional map, and if an abnormal pattern is present, determining if the abnormal pattern corresponds to an excursion in a process used to form the wafer.

19. The method of claim **18**, wherein the abnormal pattern comprises a wet cleaning problem.

20. The method of claim **1**, wherein the wafer comprises an unpatterned wafer.

21. The method of claim **1**, wherein the wafer comprises a patterned wafer.

22. The method of claim **1**, further comprising detecting the defects on the wafer using the output.

23. The method of claim **1**, wherein the output further comprises a haze map.

24. The method of claim **1**, wherein the output further comprises haze measurements.

25. The method of claim **1**, wherein the light from the wafer comprises light scattered from the wafer.

26. The method of claim **1**, wherein the characteristic affects devices being formed on the wafer.

27. The method of claim **1**, further comprising processing the wafer in a cleaning tool prior to said generating.

28. The method of claim **1**, further comprising identifying the first output by applying a threshold to the output.

29. The method of claim **1**, further comprising identifying the first output such that the first output corresponding to the defects is discriminated from the output that corresponds to noise or light scattered from a surface of the wafer.

30. A computer-implemented method for determining a characteristic of a wafer, comprising:

acquiring output responsive to light from the wafer generated by an inspection system, wherein the output comprises first output corresponding to defects on the wafer and second output that does not correspond to the defects, and wherein the first and second output are generated by the same detector of the inspection system; and

determining a value for the characteristic of the wafer using the second output and not the first output, wherein said determining comprises determining the value for the characteristic using a predetermined correlation between the second output and the characteristic, wherein the characteristic is a non-defect related characteristic of the wafer that can be measured using a metrology tool, and wherein the characteristic is a physical quantity of the wafer.

31. A system configured to determine a characteristic of a wafer, comprising:

an inspection subsystem configured to illuminate the wafer and to generate output responsive to light from the wafer, wherein the output comprises first output corresponding to defects on the wafer and second output that does not correspond to the defects, and wherein the first and second output are generated by the same detector of the inspection subsystem; and

a processor configured to determine a value for the characteristic of the wafer using the second output and not the first output, wherein the value for the characteristic is determined using a predetermined correlation between the second output and the characteristic, wherein the characteristic is a non-defect related characteristic of the wafer that can be measured using a metrology tool, and wherein the characteristic is a physical quantity of the wafer.

32. A method for determining a characteristic of a wafer, comprising:

generating output responsive to light from the wafer using an inspection system, wherein the output comprises first output corresponding to defects on the wafer and second output that does not correspond to the defects, and wherein the first and second output are generated by the same detector;

determining an average of the second output across an area on the wafer; and

determining an average value for the characteristic of the wafer using the average of the second output and not the first output, wherein said determining comprises determining the average value for the characteristic using a predetermined correlation between the average of the

second output and the average value for the characteristic, wherein the characteristic is a non-defect related characteristic of the wafer that can be measured using a metrology tool, and wherein the characteristic is a physical quantity of the wafer.

33. A method for determining a characteristic of a film formed on a wafer, comprising:

generating output responsive to light from the wafer using an inspection system, wherein the output comprises first output corresponding to defects on the wafer and second output that does not correspond to the defects, and wherein the first and second output are generated by the same detector; and

determining a value for the characteristic of the film formed on the wafer using the second output and not the first output, wherein said determining comprises determining the value for the characteristic using a predetermined correlation between the second output and the characteristic, wherein the characteristic is a non-defect related characteristic of the film that can be measured using a metrology tool, and wherein the characteristic is a physical quantity of the wafer.

34. A method for determining a characteristic of a wafer, comprising:

generating output responsive to light from the wafer using an inspection system, wherein the output comprises first output corresponding to defects on the wafer and second output that is noise and that does not correspond to the defects, and wherein the first and second output are generated by the same detector; and

determining a value for the characteristic of the wafer using the noise and not the first output, wherein said determining comprises determining the value for the characteristic using a predetermined correlation between the noise and the characteristic, wherein the characteristic is a non-defect related characteristic of the wafer that can be measured using a metrology tool, and wherein the characteristic is a physical quantity of the wafer.