CLAIMS

1. A metrology target, comprising:

a first target structure set formed on a sample, wherein the first target structure set comprises a first working zones set comprising a first working zone and at least a second working zone, wherein a first target structure is formed within the first working zone and at least a second target structure is formed within the at least second working zone, wherein the first target structure set includes periodic structures along one measurement direction, wherein an orientation of one or more patterns in the first working zone of the first working zones set is different from the orientation of one or more patterns in the at least second working zone of the first working zones set; and

a second target structure set formed on the sample, wherein the second target structure set comprises a second working zones set comprising a first working zone and at least a second working zone, wherein a first target structure is formed within the first working zone and at least a second target structure is formed within the at least second working zone, wherein the second target structure set includes periodic structures along the one measurement direction, wherein an orientation of one or more patterns in the first working zone of the first working zones set is different from the orientation of one or more patterns in the at least second working zone of the second working zones set,

wherein the first working zones set is at least two-fold rotationally symmetric about a center of rotation symmetry of the first working zones set and the second working zones set is at least two-fold rotationally symmetric about a center of rotation symmetry of the second working zones set; and

wherein a difference between the center of rotation symmetry of the first working zones set and the center of rotation symmetry of the second working zones set is indicative of overlay error along the one measurement direction.

2. The metrology target of Claim 1, wherein the at least second working zone of the first working zones set is formed diagonal to the first working zone of the first working zones set and wherein the at least second working zone of the second working zones set is formed diagonal to the first working zone of the second working zones set.

3. The metrology target of Claim 1, wherein the second working zone of the first working zones set is formed vertically adjacent to the first working zone of the first working zones set.

4. The metrology target of Claim 1, wherein the first working zone and the second working zone of the first working zones set are formed between the first working zone and the at least second working zone of the second working zones set.

5. The metrology target of Claim 1, wherein the first working zones set and the second working zones set are formed in different physical layers of the sample.

6. The metrology target of Claim 1, wherein the first working zones set and the second working zones set are formed in the same physical layer and have different features.

7. The metrology target of Claim 1, wherein the first working zone and the at least second working zone of the first working zones set contain a set of pattern elements having periodicity in one dimension and wherein the first working zone and the at least second working zone of the second working zones set contain a set of pattern elements having periodicity in one dimension.

8. The metrology target of Claim 1, wherein the first working zone and the at least second working zone of the first working zones set contain a set of pattern elements having periodicity in two dimensions and wherein the first working zone and the at least second working zone of the second working zones set contain a set of pattern elements having periodicity in two dimensions.

9. The metrology target of Claim 1, wherein an exterior form-factor of the first working zone and the at least second working zone of the first working zones set and the first working zone and the at least second working zone of the second working zones set comprise at least one of a square, a rectangle, a circle, a star, or a rhombus.

10. The metrology target of Claim 1, wherein sizes of the first working zone and the at least second working zone of the first working zones set are different from the sizes of the first working zone and the at least second working zone of the second working zones set.

11. The metrology target of Claim 1, further comprising at least three working zones.

12. A system comprising:

a controller communicatively couplable to one or more metrology sub-systems, wherein the controller includes one or more processors, wherein the one or more processors

are configured to execute a set of program instructions maintained in memory, wherein the set of program instructions is configured to cause the one or more processors to:

receive, from the one or more metrology sub-systems, one or more signals indicative of illumination emanating from a metrology target of a sample, wherein the metrology target of the sample comprises: a first target structure set formed on the sample, wherein the first target structure set comprises a first working zones set comprising a first working zone and at least a second working zone, wherein a first target structure is formed within the first working zone and at least a second target structure is formed within the at least second working zone, wherein the first target structure set includes periodic structures along one measurement direction, wherein an orientation of one or more patterns in the first working zone of the first working zones set is different from the orientation of one or more patterns in the at least second working zone of the first working zones set; and a second target structure set formed on the sample, wherein the second target structure set comprises a second working zones set comprising a first working zone and at least a second working zone, wherein a first target structure is formed within the first working zone and at least a second target structure is formed within the second working zone, wherein the second target structure set includes periodic structures along the one measurement direction, wherein an orientation of one or more patterns in the first working zone of the first working zones set is different from the orientation of one or more patterns in the at least second working zone of the second working zones set, wherein the first working zones set is at least two-fold rotationally symmetric about a center of rotation symmetry of the first working zones set and the second working zones set is at least two-fold rotationally symmetric about a center of rotation symmetry of the second working zones set, wherein a difference between the center of rotation symmetry of the first working zones set and the center of rotation symmetry of the second working zones set is indicative of one or more overlay errors between layers of the metrology target along the one measurement direction;

generate at least a first overlay measurement based on one or more signals indicative of illumination emanating from one or more portions of the first target structure set;

generate at least a second overlay measurement based on one or more signals indicative of illumination emanating from one or more portions of the second target structure set; and

determine an overlay error along the one measurement direction of the sample based on the first overlay measurement and the second overlay measurement.

13. The system of Claim 12, wherein the first overlay measurement comprises an overlay metrology measurement along at least one of the first measurement direction or the second measurement direction.

14. The system of Claim 12, wherein the second overlay measurement comprises an overlay metrology measurement along at least one of the first measurement direction or the second measurement direction.

15. The system of Claim 12, wherein the sample comprises a semiconductor wafer.

16. The system of Claim 12, wherein the at least second working zone of the first working zones set is formed diagonal to the first working zone of the first working zones set and wherein the at least second working zone of the second working zones set is formed diagonal to the first working zone of the second working zones set.

17. The system of Claim 12, wherein the second working zone of the first working zones set is formed vertically adjacent to the first working zone of the first working zones set and wherein the first working zone and the second working zone of the first working zones set are formed between the first working zone and the at least second working zone of the second working zones set.

18. The system of Claim 12, wherein the first working zones set and the second working zones set are formed in different physical layers of the sample.

19. The system of Claim 12, wherein the first working zones set and the second working zones set are formed in the same physical layer and have different features.

20. The system of Claim 12, wherein the first working zone and the at least second working zone of the first working zones set contain a set of pattern elements having periodicity in one dimension and wherein the first working zone and the at least second working zone of the second working zones set contain a set of pattern elements having periodicity in one dimension.

21. The system of Claim 12, wherein the first working zone and the at least second working zone of the first working zones set contain a set of pattern elements having periodicity in two dimensions and wherein the first working zone and the at least second working zone of the second working zones set contain a set of pattern elements having periodicity in two dimensions.

22. The system of Claim 12, wherein an exterior form-factor of the first working zone and the at least second working zone of the first working zones set and the first working zone and the at least second working zone of the second working zones set comprise at least one of a square, a rectangle, a circle, a star, or a rhombus.

23. The system of Claim 12, wherein sizes of the first working zone and the at least second working zone of the first working zones set are different from the sizes of the first working zone and the at least second working zone of the second working zones set.

24. The system of Claim 12, further comprising at least three working zones.

25. A method of measuring overlay of a sample, comprising:

illuminating the sample having a metrology target, the metrology target comprising: a first target structure set formed on the sample, wherein the first target structure set comprises a first working zones set comprising a first working zone and at least a second working zone, wherein a first target structure is formed within the first working zone and at least a second target structure is formed within the at least second working zone, wherein the first target structure set includes periodic structures along one measurement direction, wherein an orientation of one or more patterns in the first working zone of the first working zones set is different from the orientation of one or more patterns in the at least second working zone of the first working zones set; and a second target structure set formed on the sample, wherein the second target structure set comprises a second working zones set comprising a first working zone and at least a second working zone, wherein a first target structure is formed within the first working zone and at least a second target structure is formed within the second working zone, wherein the second target structure set includes periodic structures along the one measurement direction, wherein an orientation of one or more patterns in the first working zone of the first working zones set is different from the orientation of one or more patterns in the at least second working zone of the second working zones set, wherein the first working zones set is at least two-fold rotationally symmetric about a center of rotation symmetry of the first working zones set and the second working zones set is at least two-fold rotationally symmetric about a center of rotation symmetry of the second working zones set, wherein a difference between the center of rotation symmetry of the first working zones set and the center of rotation symmetry of the second working zones set is indicative of overlay error along the one measurement direction;

detecting illumination emanating from the metrology target of the sample;

generating at least a first overlay measurement based on one or more signals indicative of illumination emanating from one or more portions of the first target structure set;

generating at least a second overlay measurement based on one or more signals indicative of illumination emanating from one or more portions of the second target structure set; and

determining an overlay error along the one measurement direction of the sample based on the first overlay measurement and the second overlay measurement.

26. The method of Claim 25, wherein the first overlay measurement comprises an overlay metrology measurement along at least one of the first measurement direction or the second measurement direction.

27. The method of Claim 25, wherein the second overlay measurement comprises an overlay metrology measurement along at least one of the first measurement direction or the second measurement direction.

28. The method of Claim 25, wherein the sample comprises a semiconductor wafer.

29. The method of Claim 25, wherein the at least second working zone of the first working zones set is formed diagonal to the first working zone of the first working zones set and wherein the at least second working zone of the second working zones set is formed diagonal to the first working zone of the second working zones set.

30. The method of Claim 25, wherein the second working zone of the first working zones set is formed vertically adjacent to the first working zone of the first working zones set and wherein the first working zone and the second working zone of the first working zones set are formed between the first working zone and the at least second working zone of the second working zones set.

31. The method of Claim 25, wherein the first working zones set and the second working zones set are formed in different physical layers of the sample.

32. The method of Claim 25, wherein the first working zones set and the second working zones set are formed in the same physical layer and have different features.

33. The method of Claim 25, wherein the first working zone and the at least second working zone of the first working zones set contain a set of pattern elements having periodicity in one dimension and wherein the first working zone and the at least second

working zone of the second working zones set contain a set of pattern elements having periodicity in one dimension.

34. The method of Claim 25, wherein the first working zone and the at least second working zone of the first working zones set contain a set of pattern elements having periodicity in two dimensions and wherein the first working zone and the at least second working zone of the second working zones set contain a set of pattern elements having periodicity in two dimensions.

35. The method of Claim 25, wherein an exterior form-factor of the first working zone and the at least second working zone of the first working zones set and the first working zone and the at least second working zone of the second working zones set comprise at least one of a square, a rectangle, a circle, a star, or a rhombus.

36. The method of Claim 25, wherein sizes of the first working zone and the at least second working zone of the first working zones set are different from the sizes of the first working zone and the at least second working zone of the second working zones set.

37. The method of Claim 25, further comprising at least three working zones.

38. A method of forming a metrology target comprising:

forming a first target structure set on a sample, wherein the first target structure set comprises a first working zones set comprising a first working zone and at least a second working zone, wherein a first target structure is formed within the first working zone and at least a second target structure is formed within the at least second working zone, wherein the first target structure set includes periodic structures along one measurement direction, wherein an orientation of one or more patterns in the first working zone of the first working zones set is different from the orientation of one or more patterns in the at least second working zone of the first working zones set; and

forming a second target structure set on the sample, wherein the second target structure set comprises a second working zones set comprising a first working zone and at least a second working zone, wherein a first target structure is formed within the first working zone and at least a second target structure is formed within the second working zone, wherein the second target structure set includes periodic structures along the one measurement direction, wherein an orientation of one or more patterns in the first working zone of the first working zones set is different from the orientation of one or more patterns in the at least second working zone of the second working zones set, wherein the first working zones set is at

least two-fold rotationally symmetric about a center of rotation symmetry of the first working zones set and the second working zones set is at least two-fold rotationally symmetric about a center of rotation symmetry of the second working zones set, wherein a difference between the center of rotation symmetry of the first working zones set and the center of rotation symmetry of the second working zones set is indicative of overlay error along the one measurement direction.

39. The method of Claim 38, wherein the at least second working zone of the first working zones set is formed diagonal to the first working zone of the first working zones set and wherein the at least second working zone of the second working zones set is formed diagonal to the first working zone of the second working zones set.

40. The method of Claim 38, wherein the second working zone of the first working zones set is formed vertically adjacent to the first working zone of the first working zones set and wherein the first working zone and the second working zone of the first working zones set are formed between the first working zone and the at least second working zone of the second working zones set.

41. The method of Claim 38, wherein the first working zones set and the second working zones set are formed in different physical layers of the sample.

42. The method of Claim 38, wherein the first working zones set and the second working zones set are formed in the same physical layer and have different features.

43. The method of Claim 38, wherein the first working zone and the at least second working zone of the first working zones set contain a set of pattern elements having periodicity in one dimension and wherein the first working zone and the at least second working zone of the second working zones set contain a set of pattern elements having periodicity in one dimension.

44. The method of Claim 38, wherein the first working zone and the at least second working zone of the first working zones set contain a set of pattern elements having periodicity in two dimensions and wherein the first working zone and the at least second working zone of the second working zones set contain a set of pattern elements having periodicity in two dimensions.

45. The method of Claim 38, wherein an exterior form-factor of the first working zone and the at least second working zone of the first working zones set and the first working zone and the at least second working zone of the second working zones set comprise at least one of a square, a rectangle, a circle, a star, or a rhombus.

46. The method of Claim 38, wherein sizes of the first working zone and the at least second working zone of the first working zones set are different from the sizes of the first working zone and the at least second working zone of the second working zones set.

47. The method of Claim 38, further comprising at least three working zones.