Claims

1. A system, comprising: a controller, wherein the controller includes one or more processors and memory configured to store one or more sets of program instructions, wherein the one or more processors are configured to execute the one or more sets of program instructions, wherein the one or more sets of program instructions are configured to cause the one or more processors to: apply filtering to a semiconductor wafer map; separate the filtered semiconductor wafer map into a plurality of dies; generate a set of die comparison statistics for the plurality of dies; generate at least one excursion map by applying at least one inspection threshold to the set of die comparison statistics; and detect at least one excursion within the at least one excursion map.

2. The system in claim 1, wherein the semiconductor wafer map is received from a characterization tool.

3. The system in claim 1, wherein the semiconductor wafer map includes a pattern wafer geometry-based map.

4. The system in claim 3, wherein the pattern wafer geometry-based map includes a full wafer topography map.

5. The system in claim 1, wherein the one or more sets of program instructions are configured to cause the one or more processors to separate the filtered semiconductor wafer map into the plurality of dies based on one or more select spatial characteristics of the plurality of dies.

6. The system in claim 1, wherein the generating the set of die comparison statistics includes comparing a set of dies of the plurality of dies.

7. The system in claim 6, wherein the set of dies of the plurality of dies includes a center die and one or more proximate dies.

8. The system in claim 7, wherein the one or more proximate dies are adjacent to the center die.

9. The system in claim 7, wherein the comparing the set of dies of the plurality of dies includes generating comparison data by subtracting data corresponding to the one or more proximate dies from data corresponding to the center die.

10. The system in claim 9, wherein the comparing the set of dies of the plurality of dies includes generating comparison data by subtracting data corresponding to at least two proximate dies from data corresponding to the center die.

11. The system in claim 9, wherein the set of die comparison statistics is determined from the generated comparison data.

12. The system in claim 11, wherein the set of die comparison statistics are generated for a plurality of pixels within the set of dies of the plurality of dies.

13. The system in claim 12, wherein the set of die comparison statistics are determined on a per-pixel basis for the plurality of pixels within the set of dies of the plurality of dies.

14. The system in claim 11, wherein the at least one inspection threshold is established based on the set of die comparison statistics.

15. The system in claim 14, wherein establishing the at least one inspection threshold based on the generated set of die comparison statistics includes applying one or more data analysis algorithms to the generated set of die comparison statistics.

16. The system in claim 15, wherein the at least one excursion is detected when a value of the generated comparison data exceeds the established at least one inspection threshold.

17. The system in claim 11, wherein the at least one inspection threshold is user-specified.

18. The system in claim 1, wherein the one or more sets of program instructions are further configured to cause the one or more processors to: provide one or more control signals to at least one process tool to improve performance of one or more fabrication processes, wherein the one or more control signals are generated based on the at least one excursion.

19. The system in claim 18, wherein the improving the performance of one or more fabrication processes includes adjusting the at least one process tool to reduce one or more excursions caused by the one or more fabrication processes.

20. The system in claim 18, wherein the one or more control signals are provided to the at least one process tool via at least one of a feed forward loop or a feedback loop.

21. A system, comprising: a characterization tool; and a controller, wherein the controller includes one or more processors and memory configured to store one or more sets of program instructions, wherein the one or more processors are configured to execute the one or more sets of program instructions, wherein the one or more sets of program instructions are configured to cause the one or more processors to: apply filtering to a semiconductor wafer map from the characterization tool; separate the filtered semiconductor wafer map into a plurality of dies; generate

a set of die comparison statistics for the plurality of dies; generate at least one excursion map by applying at least one inspection threshold to the set of die comparison statistics; and detect at least one excursion within the at least one excursion map.

22. The system in claim 21, wherein the at least one inspection threshold is established based on the set of die comparison statistics.

23. The system in claim 21, wherein the at least one inspection threshold is user-specified.

24. The system in claim 21, wherein the one or more sets of program instructions are further configured to cause the one or more processors to: provide one or more control signals to at least one process tool to improve performance of one or more fabrication processes, wherein the one or more control signals are generated based on the at least one excursion.

25. A method, comprising: applying filtering to a semiconductor wafer map; separating the filtered semiconductor wafer map into a plurality of dies; generating a set of die comparison statistics for the plurality of dies; generating at least one excursion map by applying at least one inspection threshold to the set of die comparison statistics; and detecting at least one excursion within the at least one excursion map.

26. The method in claim 25, wherein the at least one inspection threshold is established based on the set of die comparison statistics.

27. The method in claim 25, wherein the at least one inspection threshold is user-specified.

28. The method in claim 25, further comprising: providing one or more control signals to at least one process tool to improve performance of one or more fabrication processes, wherein the one or more control signals are generated based on the at least one excursion.