Claims

1. An inspection system, comprising: an interferometer sub-system configured to acquire an interferogram of a sample; and a controller communicatively coupled to the interferometer sub-system, the controller including one or more processors configured to execute a set of program instructions stored in a memory, the set of program instructions configured to cause the one or more processors to: receive the interferogram from the interferometer sub-system; generate a phase map of the sample based on the received interferogram, wherein the phase map includes a plurality of pixels; select a first sub-set of pixels of the plurality of pixels of the phase map to be used for phase unwrapping procedures, wherein the selecting a first sub-set of pixels of the plurality of pixels comprises selecting one pixel of every N pixels of the plurality of pixels to be included in the first sub-set of pixels, wherein N is equal to or greater than two; perform a first set of one or more phase unwrapping procedures based on the first sub-set of pixels of the phase map to generate an unwrapped phase map; and generate a first surface height map of the sample based on the unwrapped phase map.

2. The inspection system of claim 1, wherein the controller is further configured to: select an additional sub-set of pixels of the plurality of pixels of the phase map to be used for the phase unwrapping procedures, the additional sub-set of pixels different from the first sub-set of pixels; perform an additional set of one or more phase unwrapping procedures on the additional sub-set of pixels of the phase map to generate an additional unwrapped phase map; and selectively adjust one or more characteristics of the first surface height map based on the additional unwrapped phase map.

3. The inspection system of claim 2, wherein the first set of one or more phase unwrapping procedures include one or more computationally expensive phase unwrapping procedures as compared to the additional set of one or more phase unwrapping procedures.

4. The inspection system of claim 2, wherein the additional set of one or more phase unwrapping procedures are selected based on the first surface height map.

5. The inspection system of claim 1, wherein the first set of one or more phase unwrapping procedures include at least one of a minimum norm procedure, a path following procedure, a Flynn minimum discontinuity procedure, a quality guided phase unwrapping procedure, or a phase unwrapping via max flows (PUMA) procedure.

6. The inspection system of claim 1, wherein the first surface height map is proportional to the unwrapped phase map.

7. The inspection system of claim 1, wherein an intensity map of the interferogram corresponds to a modulated representation of a surface of the sample.

8. The inspection system of claim 1, wherein the selecting a first sub-set of pixels of the plurality of pixels of the phase map to be used for phase unwrapping comprises: selecting every other pixel of the plurality of pixels to be included in the first sub-set of pixels.

9. The inspection system of claim 1, wherein the selecting a first sub-set of pixels of the plurality of pixels of the phase map to be used for phase unwrapping comprises: selecting one pixel of every N pixels of the plurality of pixels to be included in the first sub-set of pixels, wherein N is greater than two.

10. The inspection system of claim 1, wherein the selecting a first sub-set of pixels of the plurality of pixels of the phase map to be used for phase unwrapping comprises: receiving one or more input commands from a user interface, the one or more input command indicative of a user selection of the first sub-set of pixels.

11. The inspection system of claim 1, wherein the controller is further configured to: determine one or more characteristics of the sample based on the first surface height map; and generate one or more control signals configured to selectively adjust one or more characteristics of one or more process tools based on the one or more determined characteristics.

12. An inspection system, comprising: a controller communicatively coupled to an interferometer sub-system, the controller including one or more processors and a memory, the one or more processors configured to execute a set of program instructions stored in memory, the set of program instructions configured to cause the one or more processors to: receive an interferogram of a sample; generate a phase map of the sample based on the received interferogram, wherein the phase map includes a plurality of pixels; select a first sub-set of pixels of the plurality of pixels of the phase map to be used for phase unwrapping procedures, wherein the selecting a first sub-set of pixels of the plurality of pixels comprises selecting one pixel of every N pixels of the plurality of pixels to be included in the first sub-set of pixels, wherein N is equal to or greater than two; perform a first set of one or more phase unwrapping procedures on the first sub-set of pixels of the phase map to generate an unwrapped phase map; and generate a first surface height map of the sample based on the unwrapped phase map.

13. The inspection system of claim 12, wherein the interferogram is received from the interferometer sub-system communicatively coupled to the controller.

14. The inspection system of claim 12, wherein the controller is further configured to: select an additional sub-set of pixels of the plurality of pixels of the phase map to be used for the phase unwrapping procedures, the additional sub-set of pixels different from the first sub-set of pixels; perform an additional set of one or more phase unwrapping procedures on the additional sub-set of pixels of the phase map to generate an additional unwrapped phase map; and selectively adjust one or more characteristics of the first surface height map based on the additional unwrapped phase map.

15. The inspection system of claim 14, wherein the first set of one or more phase unwrapping procedures include one or more computationally expensive phase unwrapping procedures as compared to the additional set of one or more phase unwrapping procedures.

16. The inspection system of claim 14, wherein the additional set of one or more phase unwrapping procedures are selected based on the first surface height map.

17. The inspection system of claim 12, wherein the first set of one or more phase unwrapping procedures include at least one of a minimum norm procedure, a path following procedure, a

Flynn minimum discontinuity procedure, a quality guided phase unwrapping procedure, or a phase unwrapping via max flows (PUMA) procedure.

18. The inspection system of claim 12, wherein the first surface height map is proportional to the unwrapped phase map.

19. The inspection system of claim 12, wherein an intensity map of the interferogram corresponds to a modulated representation of a surface of the sample.

20. The inspection system of claim 12, wherein identifying a first sub-set of pixels of the plurality of pixels of the phase map to be used for phase unwrapping comprises: selecting every other pixel of the plurality of pixels to be included in the first sub-set of pixels.

21. The inspection system of claim 12, wherein identifying a first sub-set of pixels of the plurality of pixels of the phase map to be used for phase unwrapping comprises: selecting one pixel of every N pixels of the plurality of pixels to be included in the first sub-set of pixels, wherein N is greater than two.

22. The inspection system of claim 12, wherein identifying a first sub-set of pixels of the plurality of pixels of the phase map to be used for phase unwrapping comprises: receiving one or more input commands from a user interface, the one or more input command indicative of a user selection of the first sub-set of pixels.

23. The inspection system of claim 12, wherein the controller is further configured to: determine one or more characteristics of the sample based on the first surface height map; and generate one or more control signals configured to selectively adjust one or more characteristics of one or more process tools based on the one or more determined characteristics.

24. A method, comprising: receiving an interferogram of a sample from an interferometer sub-system; generating a phase map of the sample based on the received interferogram, wherein the phase map includes a plurality of pixels; selecting a sub-set of pixels of the plurality of pixels of the phase map to be used for phase unwrapping, wherein the selecting a sub-set of pixels of the plurality of pixels comprises selecting one pixel of every N pixels of the plurality of pixels to be included in the sub-set of pixels, wherein N is equal to or greater than two; performing one or more phase unwrapping procedures on the sub-set of pixels of the phase map to generate an unwrapped phase map; and generating a surface height map of the sample based on the unwrapped phase map.