CLAIMS

1. A method, comprising:

measuring a subset of property values in a manufacturing chamber using a plurality of sensors disposed within the manufacturing chamber during a process performed on a substrate in the manufacturing chamber; and

determining a map of property values proximate to the substrate in the manufacturing chamber based on inputting measurements of the subset of property values in the manufacturing chamber into a trained machine learning model, wherein the trained machine learning model is configured to represent property values in the manufacturing chamber in accordance with a reduced order model, wherein the map of property values is determined as a weighted additive combination of a number of members of the reduced order model; and

performing an action in view of the map of property values.

2. The method of claim 1, wherein performing the action comprises taking a corrective action or sending an alert to a client device, wherein the corrective action comprises making an adjustment to at least one processing parameter.

3. The method of claim 1, wherein the trained machine learning model comprises a sparse regression model, wherein the map of property values is determined using a sparse regression algorithm of the regression model.

4. The method of claim 1, the members chosen by the trained machine learning model to determine the map of property values being a subset of a basis set, the basis set being constructed such that weighted additive combinations of the basis set describe property values of interest in the manufacturing chamber.

5. The method of claim 4, the basis set having been determined in view of results of a physics-based computer-aided model predicting property values throughout the manufacturing chamber for a plurality of different processing parameter configurations.

6. The method of claim 1, wherein the map of property values comprises temperatures at a plurality of locations on the substrate.

7. The method of claim 6, wherein the measuring the subset of property values in the manufacturing chamber comprises taking temperature measurements at a plurality of points, at least a majority of which are not on the substrate, in the manufacturing chamber.

8. A method comprising:

generating training data for a machine learning model, wherein generating the training data comprises:

identifying a first training input comprising data indicative of first property values associated with a limited subset of property values in a manufacturing chamber; and

identifying a first target output for the first training input, wherein the first target output comprises a map of property values in a plurality of locations within the manufacturing chamber, the plurality of locations comprising more locations than the subset of property values used as the first training input; and

providing the training data to train the machine learning model on (i) a set of training inputs comprising the first training input, and (ii) a set of target outputs comprising the first target output, wherein the trained machine learning model is to receive a new input comprising data indicative of second property values associated with a limited subset of property values in the manufacturing chamber, the second property values being different than the first property values, and to produce a new output based on the new input, the new output comprising a map of property values proximate to a substrate in the manufacturing chamber.

9. The method of claim 8, wherein each training input in the set of training inputs is mapped to a target output in the set of target outputs.

10. The method of claim 8, wherein the training inputs comprise data indicative of a number of measurements taken of property values in the chamber at locations not adjacent to the substrate, and the target outputs comprise predictions of property values at the location of the substrate.

11. The method of claim 8, wherein the target outputs comprise data indicative of results of a computer-aided physics-based model, describing property values in the manufacturing chamber for a plurality of processing parameters.

12. The method of claim 11, wherein a subset of the results of the computer-aided physics-based model, corresponding to locations in the chamber where change in the value of a property of interest is above a certain threshold when steady-state conditions with different manufacturing parameters are compared, is used.

13. The method of claim 8, wherein the output of the machine learning model comprises weights to be applied to a basis set, forming an additive combination in a reduced order model.

14. The method of claim 8, wherein the machine learning model comprises a sparse regression model.

15. The method of claim 8, wherein the subset of property values comprises measurements of conditions at a limited number of locations in the chamber.

16. The method of claim 15, wherein the limited number of locations are chosen by inputting the results of a computer-aided physics-based model into a trained machine learning model, the output of the trained machine learning model comprising optimized locations to take measurements.

17. A non-transitory machine-readable storage medium storing instructions that, when executed by a processing device, cause the processing device to perform operations comprising:

receiving data indicative of measurements of a subset of property values within a manufacturing chamber containing a substrate;

determining, using a machine learning model, a map of property values within the manufacturing chamber, comprising the property values proximate to the substrate, wherein the trained machine learning model is configured to represent property values of interest in the manufacturing chamber in accordance with a reduced order model, wherein the map of property values is determined as a

weighted additive combination of a number of members of the reduced order model; and

performing at least one of (i) adjusting manufacturing parameters associated with the manufacturing chamber in view of the map of property values, or (ii) sending an alert to a user device.

18. The non-transitory machine-readable storage medium of claim 17, the operations further comprising producing an output describing a map of property values within the manufacturing chamber as coefficients for a weighted additive combination of a number of members of a basis set, the basis set constructed in view of the results of a computer-aided physics-based model of the chamber evaluated at a plurality of processing parameters.

19. The non-transitory machine-readable storage medium of claim 17, the measurements of a subset of property values in the manufacturing chamber comprising temperature measurements taken at a plurality of points within the manufacturing chamber, at least a majority of which are not on the substrate.

20. The non-transitory machine-readable storage medium of claim 17, the map of property values comprising temperatures at a plurality of points in the manufacturing chamber, the points comprising at least points on the substrate.