CLAIMS

1. A method comprising:

receiving, from one or more sensors associated with a processing chamber, sensor data indicative of a multi-level radio frequency (RF) pulse waveform detected within the processing chamber;

identifying one or more peaks in the detected multi-level RF pulse waveform, wherein each of the identified one or more peaks corresponds to at least one RF signal pulse of an RF signal pulsing within the processing chamber;

determining, based on the identified one or more peaks, whether the detected multi-level RF pulse waveform corresponds to a target multi-level RF pulse waveform; and

providing to a client device associated with the processing chamber, an indication of whether the detected multi-level RF pulse waveform corresponds to the target multi-level RF pulse waveform.

2. The method of claim 1, wherein identifying the one or more peaks in the detected multi-level RF pulse waveform comprises:

identifying one or more regions of the detected multi-level RF pulse waveform that are associated with an RF signal spike.

3. The method of claim 2, wherein the RF signal spike corresponds to a pulse of the RF signal within the processing chamber between a first state and a second state, and wherein each respective region of the one or more identified regions corresponds to a respective peak of the identified one or more peaks.

4. The method of claim 2, wherein determining whether the detected multi-level RF pulse waveform corresponds to the target multi-level RF pulse waveform comprises:

determining whether at least one of a location or a magnitude of a respective identified region of the detected multi-level RF pulse waveform corresponds to at least one of a target location or a target magnitude of a target signal spike region of the target multi-level RF pulse waveform; and

responsive to determining that the at least one of the location or the magnitude of the respective identified region corresponds to the at least one of the target location or the target

magnitude of the target signal spike region, determining that the detected multi-level RF pulse waveform corresponds to the target multi-level RF pulse waveform.

5. The method of claim 2, wherein identifying the one or more peaks in the detected multi-level RF pulse waveform further comprises:

applying one or more data transform operations to the sensor data to obtain transformed multi-level RF pulse waveform data, wherein the data transform operations amplify an intensity of one or more RF signal spikes associated with the detected multi-level RF pulse waveform, and wherein the one or more regions associated with the RF signal spike are identified based on the transformed multi-level RF pulse waveform.

6. The method of claim 1, wherein identifying the one or more peaks in the detected multi-level RF pulse waveform comprises:

providing the sensor data as input to a machine learning model trained to predict one or more regions of a respective multi-level RF pulse waveform that are associated with an RF signal spike;

obtaining one or more outputs of the machine learning model; and

extracting, from the one or more obtained outputs, RF signal spike region data.

7. The method of claim 6, wherein the RF signal spike region data indicates one or more regions of the detected multi-level RF pulse waveform that include RF signal spikes, and wherein the one or more peaks in the detected multi-level RF pulse waveform correspond to the one or more regions indicated by the RF signal spike region data that include the RF signal spikes.

8. The method of claim 1, wherein the one or more sensors associated with the processing chamber include an optical frequency sensor (OFS).

9. A non-transitory machine-readable storage medium storing instructions which, when executed, cause a processing device to:

receive, from one or more sensors associated with a processing chamber, sensor data indicative of a multi-level radio frequency (RF) pulse waveform detected within the processing chamber;

identify one or more peaks in the detected multi-level RF pulse waveform, wherein each of the identified one or more peaks corresponds to at least one RF signal pulse of an RF signal pulsing within the processing chamber;

determine, based on the identified one or more peaks, whether the detected multi-level RF pulse waveform corresponds to a target multi-level RF pulse waveform; and

provide to a client device associated with the processing chamber, an indication of whether the detected multi-level RF pulse waveform corresponds to the target multi-level RF pulse waveform.

10. The non-transitory machine-readable storage medium of claim 9, wherein identifying the one or more peaks in the detected multi-level RF pulse waveform comprises:

identifying one or more regions of the detected multi-level RF pulse waveform that are associated with an RF signal spike.

11. The non-transitory machine-readable storage medium of claim 10, wherein the RF signal spike corresponds to a pulse of the RF signal within the processing chamber between a first state and a second state, and wherein each respective region of the one or more identified regions corresponds to a respective peak of the identified one or more peaks.

12. The non-transitory machine-readable storage medium of claim 10, wherein determining whether the detected multi-level RF pulse waveform corresponds to the target multi-level RF pulse waveform comprises:

determining whether at least one of a location or a magnitude of a respective identified region of the detected multi-level RF pulse waveform corresponds to at least one of a target location or a target magnitude of a target signal spike region of the target multi-level RF pulse waveform; and

responsive to determining that the at least one of the location or the magnitude of the respective identified region corresponds to the at least one of the target location or the target magnitude of the target signal spike region, determining that the detected multi-level RF pulse waveform corresponds to the target multi-level RF pulse waveform.

13. The non-transitory machine-readable storage medium of claim 10, wherein identifying the one or more peaks in the detected multi-level RF pulse waveform further comprises:

applying one or more data transform operations to the sensor data to obtain transformed multi-level RF pulse waveform data, wherein the data transform operations amplify an intensity of one or more RF signal spikes associated with the detected multi-level RF pulse waveform, and wherein the one or more regions associated with the RF signal spike are identified based on the transformed multi-level RF pulse waveform.

14. The non-transitory machine-readable storage medium of claim 9, wherein identifying the one or more peaks in the detected multi-level RF pulse waveform comprises:

providing the sensor data as input to a machine learning model trained to predict one or more regions of a respective multi-level RF pulse waveform that are associated with an RF signal spike;

obtaining one or more outputs of the machine learning model; and

extracting, from the one or more obtained outputs, RF signal spike region data.

15. The non-transitory machine-readable storage medium of claim 14, wherein the RF signal spike region data indicates one or more regions of the detected multi-level RF pulse waveform that include RF signal spikes, and wherein the one or more peaks in the detected multi-level RF pulse waveform correspond to the one or more regions indicated by the RF signal spike region data that include the RF signal spikes.

16. A system comprising:

a memory; and

a processing device coupled to the memory, the processing device to:

receive, from one or more sensors associated with a processing chamber, sensor data indicative of a multi-level radio frequency (RF) pulse waveform detected within the processing chamber;

identify one or more peaks in the detected multi-level RF pulse waveform, wherein each of the identified one or more peaks corresponds to at least one RF signal pulse of an RF signal pulsing within the processing chamber;

determine, based on the identified one or more peaks, whether the detected multi-level RF pulse waveform corresponds to a target multi-level RF pulse waveform; and

provide to a client device associated with the processing chamber, an indication of whether the detected multi-level RF pulse waveform corresponds to the target multi-level RF pulse waveform.

17. The system of claim 16, wherein identifying the one or more peaks in the detected multi-level RF pulse waveform comprises:

identifying one or more regions of the detected multi-level RF pulse waveform that are associated with an RF signal spike, wherein the RF signal spike corresponds to a pulse of the RF signal within the processing chamber between a first state and a second state, and wherein each respective region of the one or more identified regions corresponds to a respective peak of the identified one or more peaks.

18. The system of claim 17, wherein determining whether the detected multi-level RF pulse waveform corresponds to the target multi-level RF pulse waveform comprises:

determining whether at least one of a location or a magnitude of a respective identified region of the detected multi-level RF pulse waveform corresponds to at least one of a target location or a target magnitude of a target signal spike region of the target multi-level RF pulse waveform; and

responsive to determining that the at least one of the location or the magnitude of the respective identified region corresponds to the at least one of the target location or the target magnitude of the target signal spike region, determining that the detected multi-level RF pulse waveform corresponds to the target multi-level RF pulse waveform.

19. The system of claim 17, wherein identifying the one or more peaks in the detected multi-level RF pulse waveform further comprises:

applying one or more data transform operations to the sensor data to obtain transformed multi-level RF pulse waveform data, wherein the data transform operations amplify an intensity of one or more RF signal spikes associated with the detected multi-level RF pulse waveform, and wherein the one or more regions associated with the RF signal spike are identified based on the transformed multi-level RF pulse waveform.

20. The system of claim 16, wherein identifying the one or more peaks in the detected multi-level RF pulse waveform comprises:

providing the sensor data as input to a machine learning model trained to predict one or more regions of a respective multi-level RF pulse waveform that are associated with an RF signal spike;

obtaining one or more outputs of the machine learning model; and

extracting, from the one or more obtained outputs, RF signal spike region data.