CLAIMS

1. A method for determining a temperature error of a pyrometer, comprising:

measuring a first signal with a first sensor of the pyrometer;

measuring a second signal with a second sensor of the pyrometer;

determining a reflectivity of a reflector plate from the first signal and the second signal; and

determining the temperature error using the reflectivity,

wherein the first signal from the first sensor is the light signal from directly above the light pipe and the second signal from the second sensor is the light signal obtained from a wide angle over the light pipe; and

wherein the reflectivity of the reflector plate is determined using a ratio of the light signal from directly above the light pipe and the light signal obtained from the wide angle over the light pipe.

2. The method of claim 1, wherein the first sensor is an emissometer sensor and the second sensor is a main sensor.

3. The method of claim 1, wherein the temperature error is proportional to the change in the reflectivity of the reflector plate compared to an original state of the reflector plate.

4. The method of claim 3, wherein the change in the reflectivity is the result of material deposition on the reflector plate.

5. The method of claim 1, wherein the reflectivity is used to determine an effective emissivity.

6. The method of claim 5, wherein the effective emissivity is used to determine a relative signal loss.

7. The method of claim 1, further comprising:

comparing the temperature error with an estimated temperature error provided by a physics based model.

8. The method of claim 7, wherein the temperature error is stored for future use when an absolute value of a difference between the temperature error and the estimated temperature error is less than a predetermined threshold.

9. The method of claim 8, wherein the predetermined threshold is 10% of the temperature error.

10. A system for processing substrates, comprising:

a chamber;

a substrate holder for supporting a substrate;

a heating element for heating the substrate;

a reflector plate below the substrate; and

a pyrometer through the reflector and configured to measure a temperature of the substrate, wherein the pyrometer is capable of being used to detect a temperature error resulting from deposition on the reflector plate, wherein a method to detect the temperature error comprises:

measuring a first signal with a first sensor of the pyrometer;

measuring a second signal with a second sensor of the pyrometer;

determining a reflectivity of the reflector plate from the first signal and the second signal; and

determining the temperature error using the reflectivity,

wherein the first signal from the first sensor is the light signal from directly above the light pipe and the second signal from the second sensor is the light signal obtained from a wide angle over the light pipe; and

wherein the reflectivity of the reflector plate is determined using a ratio of the light signal from directly above the light pipe and the light signal obtained from the wide angle over the light pipe.

11. The system of claim 10, wherein the first sensor is an emissometer sensor and the second sensor is a main sensor.

12. The system of claim 10, wherein the temperature error is proportional to the change in the reflectivity of the reflector plate compared to an original state of the reflector plate.