CLAIMS

1. A method, comprising:

chemically altering a Josephson junction of a Josephson junction resonator via a plasma treatment;

selectively tuning an operating frequency of the Josephson junction resonator based on a property of the plasma treatment, wherein the plasma treatment alters an electrical resistance of the Josephson junction; and

localizing the plasma treatment to a proximity of the Josephson junction via a plasma beam.

2. The method according to the preceding claim, wherein the property is at least one member selected from the group consisting of: a processing time of the plasma treatment, a chemical composition of the plasma treatment, an amount of energy delivered to the Josephson junction by the plasma treatment, and a partial pressure of a gas employed by the plasma treatment.

3. The method according to any of the preceding claims, wherein the plasma treatment exposes the Josephson junction to a series of plasmas.

4. The method according to any of the preceding claims, further comprising:

depositing a mask layer onto the Josephson junction resonator, wherein the mask layer comprises a hole that correlates to a position of the Josephson junction, and wherein the mask layer protects a second Josephson junction from the plasma treatment.

5. The method according to the preceding claim, wherein the mask layer comprises a first surface facing the Josephson junction and a second surface facing the plasma treatment, wherein the first surface is characterized by a chemical composition that absorbs a plasma species of the plasma treatment, and wherein the second surface is characterized by another chemical composition that is inert to the plasma treatment.

6. The method according to any of the two preceding claims, further comprising:

patterning an electrode at a perimeter of the hole in the mask layer, and

controlling migration of a reactive species of the plasma treatment across the mask layer via operation of the electrode.

7. The method according to any of the preceding claims, further comprising:

compressing an inert gasket onto the Josephson junction resonator, wherein the inert gasket comprises a hole that correlates to a position of the Josephson junction, and wherein the inert gasket seals a second Josephson junction neighboring the Josephson junction from the plasma treatment.

8. A method, comprising:

chemically altering a Josephson junction of a Josephson junction resonator via a plasma treatment;

adjusting an electrical resistance of the Josephson junction based on a property of the plasma treatment; and

localizing the plasma treatment to a proximity of the Josephson junction via a plasma beam.

9. The method according to the preceding claim, wherein the plasma treatment exposes the Josephson junction to a series of plasmas, wherein the plasma treatment alters the electrical resistance of the Josephson junction, and wherein the property is at least one member selected from the group consisting of a processing time of the plasma treatment, a chemical composition of the plasma treatment, an amount of energy delivered to the Josephson junction by the plasma treatment, and a partial pressure of a gas employed by the plasma treatment.

10. The method according to any of the two preceding claims, further comprising:

depositing a mask layer onto the Josephson junction resonator, wherein the mask layer comprises a hole that correlates to a position of the Josephson junction, and wherein the mask layer protects a portion of the Josephson junction resonator from the plasma treatment.

11. The method according to the preceding claim, wherein the mask layer comprises a first surface facing the Josephson junction resonator and a second surface facing the plasma treatment, wherein the first surface is characterized by a chemical composition that

absorbs a plasma species of the plasma treatment, and wherein the second surface is characterized by another chemical composition that is inert to the plasma treatment.

12. The method according to any of the four preceding claims, further comprising:

compressing an inert gasket onto the Josephson junction resonator, wherein the inert gasket comprises a hole that correlates to a position of the Josephson junction, and wherein the inert gasket seals a second Josephson junction neighboring the Josephson junction from the plasma treatment.

13. A method, comprising:

exposing a Josephson junction of a Josephson junction resonator to a plasma treatment, wherein the plasma treatment tunes an operating frequency of the Josephson junction resonator to a target operating frequency by altering an electrical resistance of the Josephson junction; and

shielding a second Josephson junction from the plasma treatment, wherein the second Josephson junction neighbors the Josephson junction of the Josephson junction resonator.

14. The method according to the preceding claim, wherein the plasma treatment exposes the Josephson junction to a series of plasmas.

15. The method according to any of the two preceding claims, further comprising:

localizing the plasma treatment to a proximity of the Josephson junction via a plasma beam.