big, bulky, and a relatively expensive unit. Its power conversion efficiency could also be low resulting in a significant production of waste heat. Deficiencies also include reliability and reproducibility of analytical results.

**[0005]** These and other deficiencies have been identified when technologies such as mass cytometry find their applications among biologists. These and other needs are addressed.

## BRIEF SUMMARY

**[0006]** Embodiments described herein include subsystems to supply RF power to an inductively coupled plasma (ICP) torch. The disclosure addresses some technical aspects of RF power converter as well as design of the load coil and resonating RF tank circuit for ICP. Systems and methods described herein cancel RF on the axis due to the symmetry of applied voltages and the symmetry of the load coil. Thus, RF balancing is accomplished by design without the need for finding and tuning the optimal RF voltage ratio. Embodiments also allow for high RF currents and low RF voltages, reducing the risk of RF breakdown outside the torch. Transistors may be used to deliver RF power. Embodiments may result in a compact ICP assembly.

**[0007]** In a first aspect, there is provided an RF coil resonator that may include a plurality of loops. Each loop of the plurality of loops may be connected to the other loops of the plurality of loops to be electrically parallel when a voltage is applied to the plurality of loops. The RF coil resonator may in addition include a power supply in electrical communication with the plurality of loops. The power supply may be in a circuit configured to deliver a first phase of RF power to a first terminal of the plurality of loops and a second phase of RF power to a second terminal of the plurality of loops.

**[0007a]** In a second aspect, there is provided a module including the above RF coil resonator and a sampler.

**[0007b]** In a third aspect, there is provided a system including the above module and a detector.

**[0008]** In a fourth aspect, there is provided an RF power module that may include a DC power supply. The RF power module may in addition include a plurality of transistors in electrical communication with the DC power supply. The RF power module may also include a plurality of gate drivers. Each gate driver of the plurality of gate drivers may be connected to a separate transistor of the plurality of transistors. The RF power module may further include a processor. The processor may be configured to control the plurality of gate drivers to open and close the plurality of transistors in order to convert DC current from the DC power supply into RF current.