

applying a voltage or current to the plurality of CMOS fabricated field-generation components via a plurality of programmable switching or multiplexing components.

27. The method of claim 24, wherein the act A1) comprises an act of:

A2) applying at least one high frequency signal to at least one field-generation component of the plurality of CMOS fabricated field-generation components to facilitate at least one of detection, imaging and characterization of the at least one sample.

28. The method of claim 27, wherein the act A2) comprises an act of:

monitoring a frequency of the at least one high frequency signal, wherein the frequency indicates the presence or absence of the at least one sample in proximity to the at least one field-generation component.

29. The method of claim 27, further comprising an act of:

C) regulating a temperature of the at least one sample.

30. The method of claim 22, wherein the plurality of CMOS fabricated field-generating components includes a plurality of microcoils, each microcoil including at least two axially concentric spatially separated portions of conductor turns.

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