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(54) Title (EN): QUANTUM COMPUTING DEVICE

(54) Title (FR): DISPOSITIF INFORMATIQUE QUANTIQUE

(54) Title (JA): 量子計算素子

(57) Abstract:

(EN): Provided is a quantum computing device having a reduced number of electrodes. The quantum computing device is provided with: a plurality of superconducting lines which are arranged so as to form at least two unit lattices in plan view, and which each constitute a quantum bit by an electromagnetic state; a plurality of first couplers which are provided at intersecting portions of the plurality of superconducting lines, and which cause two quantum bits to interact with each other; a plurality of second couplers which cause two quantum bits included in different unit lattices among the at least two unit lattices to interact with each other; and a plurality of electrodes which are electrically connected to any of the plurality of superconducting lines, the plurality of first couplers, and the plurality of second couplers. At least some of the plurality of second couplers are not electrically connected to any of the plurality of electrodes.

(FR): La présente invention concerne un dispositif informatique quantique présentant un nombre réduit d'électrodes. Le dispositif informatique quantique est pourvu : d'une pluralité de lignes supraconductrices disposées de façon à former au moins deux réseaux unitaires dans une vue en plan, et constituant chacune un bit quantique par un état électromagnétique; d'une pluralité de premiers coupleurs disposés au niveau de parties d'intersection de la pluralité de lignes supraconductrices, et amenant deux bits quantiques à interagir entre eux; d'une pluralité de seconds coupleurs amenant deux bits quantiques compris dans des réseaux unitaires différents parmi les deux réseaux unitaires ou plus à interagir entre eux; et d'une pluralité d'électrodes connectées électriquement à l'une quelconque de la pluralité de lignes supraconductrices, de la pluralité de premiers coupleurs et de la pluralité de seconds coupleurs. Au moins certains coupleurs de la pluralité de seconds coupleurs ne sont pas connectés électriquement à l'une quelconque de la pluralité d'électrodes.

(JA): 電極の数をより少なくした量子計算素子を提供する。量子計算素子は、平面視において少なくとも2つの単位格子を形成するように配置され、それぞれ電磁的状态によって量子ビットを構成する複数の超電導線路と、複数の超電導線路の交差箇所に設けられ、2つの量子ビットを相互作用させる複数の第1カプラと、少なくとも2つの単位格子のうち異なる単位格子に含まれる2つの量子ビットを相互作用させる複数の第2カプラと、複数の超電導線路、複数の第1カプラ及び複数の第2カプラのいずれかに電氣的に接続される複数の電極と、を備え、複数の第2カプラの少なくとも一部は、複数の電極のいずれにも電氣的に接続されていない。

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