**CLAIMS**

1. Tunable coupler for making a controllable coupling to at least a first qubit (801, 1501), comprising:
- a first constant coupling element (803, 1506), and
- a tunable coupling element (804, 1509 ), there being a coupling (814) between said first constant coupling element (803, 1506) and said tunable (804, 1509) coupling element;
wherein:
- said first constant coupling element (803, 1506) forms a non-galvanic coupling interface to at least said first qubit (801, 1501) at a first extremity of said first constant coupling element (803, 1506) distant from said tunable coupling element (804, 1509),
- said tunable coupling element (804, 1509) is located adjacent to a non-galvanic coupling interface formed to a further circuit element (802, 805, 1507) at a second extremity of said first constant coupling element (803, 1506), there being a coupling between said tunable coupling element (804, 1509) and said further circuit element (802, 805, 1507),
- a strength of the coupling (814) between the first constant coupling element (803, 1506) and the tunable coupling element (804, 1509), as well as the strength of the coupling between said tunable coupling element (804, 1509) and said further circuit element (802, 805, 1507) depend on how the tunable coupling element (804, 1509) is tuned, and
- said further circuit element (802, 805, 1507) is a second constant coupling element or a second qubit.

2. Tunable coupler according to claim 1, wherein said first constant coupling element (803, 1506) is a waveguide.

3. Tunable coupler according to claim 2, wherein said first constant coupling element (803, 1506) is a waveguide resonator.

4. Tunable coupler according to claim 1, wherein said first constant coupling element (803, 1506) is a lumped element resonator.

5. Tunable coupler according to claim 1, wherein said first constant coupling element (803, 1506) is a conductor island.

6. Tunable coupler according to any of the preceding claims, wherein:
- said further circuit element (805) is the second constant coupling element, which is comprised in the tunable coupler,
- said second constant coupling element (805) forms a non-galvanic coupling interface to a second qubit (802) at an extremity of said second constant coupling element (805) distant from said tunable coupling element (804).

7. Tunable coupler according to claim 6, wherein said second constant coupling element (805) is one of: waveguide, waveguide resonator, lumped element resonator, conductor island.

8. Tunable coupler according to claim 6 when depending on any of claims 1 to 2, wherein:
- said first and second constant coupling elements (803, 805) are waveguides,
- each of said first and second constant coupling elements (803, 805) comprises a respective coupling area (1301, 1302) at the respective extremity adjacent to which the tunable coupling element (804) is located, and
- the respective coupling areas (1301, 1302) of the

first and second constant coupling elements (803, 805) both comprise a first edge adjacent to the first edge of the other coupling area and a second edge adjacent to a respective edge of the tunable coupling element (804).

9. Tunable coupler according to claim 8, wherein:
- the tunable coupling element (804) occupies a first sector of an annular two-dimensional region,
- each of said respective coupling areas (1301, 1302) of the first and second constant coupling elements (803, 805) occupies a respective further sector of said annular two-dimensional region,
- said further sectors are adjacent sectors of said annular two-dimensional region, and
- together said first sector and said further sectors cover the whole of said annular two-dimensional region.

10. Tunable coupler according to any of claims 1-5, wherein:
- the tunable coupler comprises a chain of consecutive constant coupling elements (1506, 1507, 1508), of which said first constant coupling element (1506) is one, with non-galvanic coupling interfaces formed between consecutive constant coupling elements (1506, 1507, 1508) in said chain, and
- the tunable coupler comprises at least two tunable coupling elements (1509, 1510), each of said at least two tunable coupling elements being adjacent to a respective one of said non-galvanic coupling interfaces formed between consecutive constant coupling elements (1506, 1507, 1508) in said chain.

11. A quantum computing circuit, comprising:
- a tunable coupler according to any of claims 1 to 10, and

- at least one qubit (801, 802), with said tunable coupler forming a controllable coupling to said at least one qubit.

12. A quantum computing circuit according to claim 11, comprising another qubit (801, 802), so that said tunable coupler forms a controllable coupling between said at least one qubit and said another qubit.