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(54) Title: ELECTRON HOLE SPIN QUBIT TRANSISTOR, AND METHODS FOR FORMING A ELECTRON HOLE SPIN QUBIT TRANSISTOR

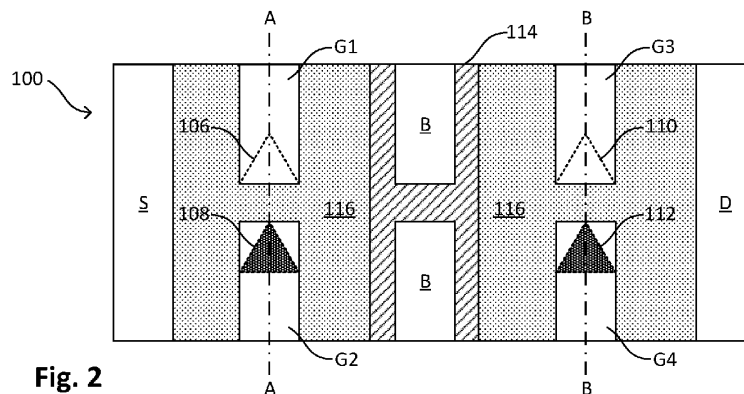


Fig. 2

(57) Abstract: The present inventive concept relates to a spin qubit transistor (100) comprising a base layer (102), a first qubit comprising, a first computing semiconductor island (106) and a first readout semiconductor island (108) arranged with a distance in the range of 3-10 nm therebetween, a second qubit comprising, a second computing semiconductor island (110) and a second readout semiconductor island (112) arranged with a distance in the range of 3-10 nm therebetween, wherein each of said semiconductor islands has a size causing each of said semiconductor islands to exhibit 3-dimensional quantum confinement of a single electron hole, and wherein each of said semiconductor islands forms a semiconductor heterojunction with the base layer. Each of the semiconductor islands has a corresponding gate (G1-G4), for modulation of the computing islands or readout of the readout islands. Said first computing semiconductor island and said second computing semiconductor island are configured to have a unique resonance frequency respectively. A control electrode arrangement (B) between the computing and the readout islands controls the coupling between the qubits. The present inventive concept further comprises a method for forming a spin qubit transistor and a quantum computer comprising at least one spin qubit transistor.

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