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(54) **Title:** QUANTUM AMPLITUDE ESTIMATION USING DIRECTION OF ARRIVAL ESTIMATION

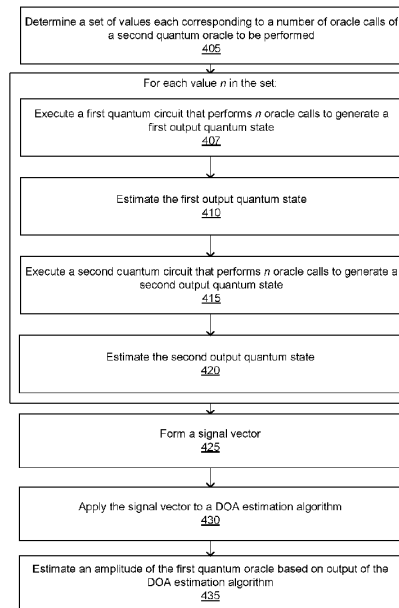


FIG. 4

(57) **Abstract:** Some embodiments relate to estimating the amplitude of a first quantum oracle. A computing system may determine a set of values corresponding to a number of oracle calls of a second quantum oracle, where the second oracle is based on the first oracle. For each value n in the set, the computing system may: execute a first quantum circuit that performs n oracle calls of the second oracle to generate a first output quantum state, estimate the first output quantum state, execute a second quantum circuit that performs n oracle calls of the second oracle to generate a second output quantum state, and estimate the second output quantum state. The computing system may form a signal vector, apply the signal vector to a direction of arrival (DOA) estimation algorithm, and estimate the amplitude of the first oracle based on output of the DOA estimation algorithm.

[Continued on next page]

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