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(54) Title: AUGMENTED SEMICONDUCTOR LASERS WITH SPONTANEOUS EMISSIONS BLOCKAGE

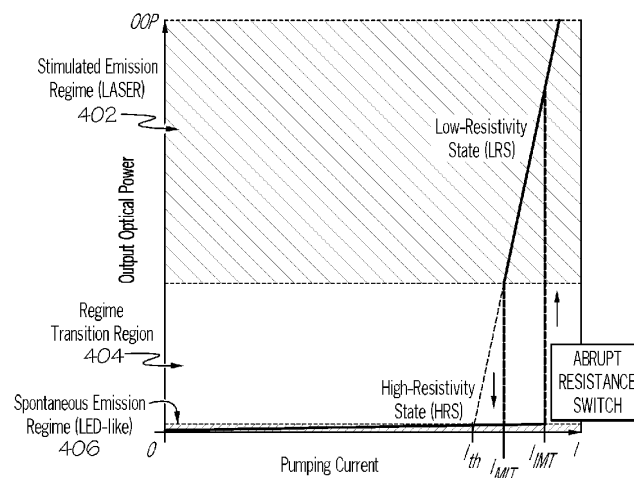


FIG. 4

(57) Abstract: A device and a method to produce an augmented-laser (ATLAS) comprising a bi-stable resistive system (BRS) integrated in series with a semiconductor laser. The laser exhibits reduction/inhibition of the Spontaneous Emission (SE) below lasing threshold by leveraging the abrupt resistance switch of the BRS. The laser system comprises a semiconductor laser and a BRS operating as a reversible switch. The BRS operates in a high resistive state in which a semiconductor laser is below a lasing threshold and emitting in a reduced spontaneous emission regime, and a low resistive state in which a semiconductor laser is above or equal to a lasing threshold and emitting in a stimulated emission regime. The BRS operating as a reversible switch is electrically connected in series across two independent chips or on a single wafer. The BRS is formed using insulator-to-metal transition (IMT) materials or is formed using threshold-switching selectors (TSS).

[Continued on next page]

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