DC SQUID(Superconducting Quantum Interference Device) is an electronic circuit, which consists two parallel Josephson junctions in a superconductive loop. [1] Two important phenomena characterize DC SQUID’s physical behaviors, one of them is Josephson tunnelling and another is magnetic flux quantization. Josephson junctions induce Josephson tunneling, and superconductive loop cause quantization of magnetic flux inside the loop. Inside the superconductive loop, magnetic flux is integer multiplier of magnetic flux quanta . ()[1], [2] There is a relation between applied external magnetic field and critical current of the DC SQUID. According to the relation, average voltage across to the DC SQUID is related with /. ( is magnetic flux due to external magnetic field.) Due to the value of magnetic flux quanta (), sensitive magnetic fields measurement can be done by using DC SQUIDs. [1], [2] Today DC SQUIDs are extensively used in commercially applications. (Microscopy, readout electronics, nondestructive test, biomagnetism applications…)[2], [3] DC SQUID’s voltage response against external applied magnetic field is limitedly linear, this situation may cause difficulties in applications. As a result of difficulties, researchers tend to investigate SQUID based circuits, which is more linear than conventional DC SQUIDs (Bi-SQUID, arrays of SQUIDs, …, etc.). Bi-SQUID is one of the alternative solutions instead of the conventional DC SQUID, Bi-SQUID is designed by adding a parallel Josephson junction to typical DC SQUID. Bi-SQUID ‘s voltage response against external applied magnetic field is more linear than DC SQUID. [4] Magnetic field response of Bi-SQUID characterized by set of differential equations, there is no easy analytic way to solve these equations. [4], [5] Numerical simulations play critical role for this type of systems, modelling and simulation methods can support design studies. In this work, we designed open source and user-friendly simulation tool. In addition, we did statistical analysis study for Bi-SQUID by using simulation tool.

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