High-Inductance Bi-SQUID

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Abstract—**We performed an in-depth numerical analysis of high inductance bi-SQUIDs with normalized inductance of its one-junction loop *l* >> 1. This is desired for better coupling with the external signals and for the high temperature superconductor implementations. Typically the high linearity (up to 90 dB) can be achieved in bi-SQUIDs at *l* ≤ 1 at which its flux-to–voltage characteristic has a distinct triangular shape. We showed that the high linearity can be also achieved at *l* > 1, when bi-SQUID has a hysteretic response. The critical current of the third Josephson junction is to be of the same order as the one of the other two Josephson junctions, and inductance *l*$_{DC}$ of the second (two-junction) loop is allowed to be as high as about *l*/4 in the presence of the high linearity.**

Keywords (Index Terms)—**Josephson junctions; bi-SQUID; highly linear voltage output.**