

## Coupled Self-generations in 1-D Josephson Junctions Array

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We have developed a simulation model of 1-dimensional Josephson junctions array (virtual array) in a form of microwave transmission line for Josephson voltage metrology. The microwave redistribution by coupled self-generations and the effect on  $I$ - $V$  curves of SINIS-, SNS- and SIS- Josephson junction arrays were simulated for typical parameters of the Josephson arrays for programmable Josephson voltage standard. For all arrays we investigated only the 1<sup>st</sup> Shapiro step, which is sufficient for the next generation programmable Josephson voltage metrology. In case of SINIS array, McCumber parameter of  $\beta$ -1 and larger transmission line impedance would be better to obtain maximum step size. In case of SNS array increase of coupling would be tolerable, because the coupling effect is positive, too. The simulation approach allows us to predict the effect of parameter variations and provides useful information on the microwave properties which are important for design of the Josephson junction array.

Keywords : Microwave redistribution, coupled self-generations, Josephson junction array, simulation

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