Circuit Simulator for the Prediction of Electromagnetic Induction up to the Data Transmission Frequency in Railway Environment

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On the traction circuit, the feeding current causes inductive interferences with metallic telecommunication lines. Therefore, we need to reduce the influence of electromagnetic induction by computer simulation. A circuit analysis program for railway environment named ABTAC is available, but the calculation method is applicable only for a low frequency and conductors in structure are ignored. Nowadays, high speed data transmission systems using metallic telecommunication lines such as xDSL (Digital Subscriber Line) are being introduced and a higher frequency than the audio frequency is used by these systems. Considering the electromagnetic screening effect of conductors in structures enables the prediction of electromagnetic induction to be more accurate. In this study, we developed new circuit simulator. It can take conductors in structure into account and it can calculate voltage and current up to data transmission frequency.