

A Study on Reduction Method of Lightning Overvoltage induced in Railway Signalling Cables

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Railway signalling systems of Japanese railway companies have been often damaged by lightning. Therefore, effective and economical lightning protection measures are necessary for railway signalling systems. In this paper, the authors measured lightning overvoltages induced in railway signalling cables installed in the field for experiment, and compared the line voltages of signalling cables with the voltages of signalling cables against the ground. With respect to the current lightning protection measures, it has been made clear that the lightning protection performance between the lines is higher than that against the ground. Therefore, the authors proposed the reduction method of the voltage of signaling cables against the ground used by the SPD (Surge Protective Device) attached to the spare line adjacent to the line, because the stray current through the grounding lines may cause interference with the railway signalling equipment. The validity of this method was confirmed by the FDTD (Finite Difference Time Domain) method.