

Research and experiments of electromagnetic wave transmission rate in different kinds of cable

Binwu Wang (1), Xueliang Zhu (1), Guangxin Zhai (1), Wei Wang (2)

- 1 Wuhan Talentum Electric Power CO., TLD, No.4 Huanglongshanbei Road, Wuhan City, Hubei Province, China. wangbinwu@yahoo.com, avx302@gmail.com, g.x.zhai@gmail.com
- 2 State Grid Electric Power Research Institute. No.143 Luoyudong Road, Wuhan City, Hubei Province, China. wangwei3@sgepri.sgcc.com.cn

Because of the importance of UHF signals in the measurement of partial discharge increasingly prominent, this paper based on the theory of electromagnetic wave, analyzed the wave transmission rate in different voltage classes, different cross sectional area. By the experiments, it is found that many factors influence transmission speed. Without considering the waveguide effect of electromagnetic wave in semi conducting and conductor, large error will be produced in practical applications. A lot of transmission experiments had been done in 10 kV (120 mm², 150 mm²), 35 kV (150mm², 185 mm²) and 110 kV (500 mm², 630 mm²) cables. After statistics, analysis, fitting of the experimental data, a nonlinear correction term had been gotten. By this correction, the calculation error in the original equation was reduced to 2.98%.

Key words

XPLE cables; Transmission rate; Electromagnetic wave; High frequency signal