

## ELF帯誘導磁場測定による落雷電流波形推定 Estimation of lightning current waveform from ELF magnetic induction field

土屋 史紀<sup>1\*</sup>, 本間規泰<sup>2</sup>, 佐藤 光輝<sup>3</sup>, 鶴島 大樹<sup>1</sup>, 高橋 幸弘<sup>3</sup>  
Fuminori Tsuchiya<sup>1\*</sup>, Noriyasu Honma<sup>2</sup>, Mitsuteru Sato<sup>3</sup>, Daiki Tsurushima<sup>1</sup>, Yukihiro Takahashi<sup>3</sup>

<sup>1</sup> 東北大学, <sup>2</sup> 東北電力, <sup>3</sup> 北海道大学

<sup>1</sup>Tohoku University, <sup>2</sup>Tohoku Electric Power Company, Inc., <sup>3</sup>Hokkaido University

New project to estimate lightning current waveform from ELF magnetic field observation is introduced. A positive GC lightning event in winter was detected by a Rogowski coil at Mt. Ogami, Niigata Prefecture, Japan on Jan. 2010. The peak current and the electric charge were 26 kA and about 1 kilo-coulomb, respectively. Electromagnetic radiation from the lightning was measure by Lightning Location System (LLS) in Tohoku district and ELF magnetic field observation at Onagawa observatory, Miyagi Prefecture. Although only pulse series' were radiated in LF, a horizontal magnetic field waveform resembling the current waveform was observed in ELF. At the distance of Onagawa (296 km apart from Ogami), the ELF waveform should resemble that of the source current because the ELF signal is mostly composed of the induction components. This means the ELF signal has potential to use direct estimation of current waveform of any lightning discharge as well as the amount of electric charge causing damage to grounded structures. Comparisons of waveforms between the current and ELF have done for several lightning events to find the statistical properties. New observation site is planned in Kyushu distinct with a cooperation of ICSWSE, Kyushu University.