

## Electromagnetic and stroke current observations on rocket-triggered lightning

\*Takeshi Morimoto<sup>1</sup>, Shinya Kurokawa<sup>1</sup>, Yoshitaka Nakamura<sup>2</sup>, Kazuo Yamamoto<sup>3</sup>

1. Kindai University, 2. Kobe City College of Technology, 3. Chubu University

Rocket-triggered lightning is the most effective technique for artificial triggering lightning. It involves launching a small rocket trailing a thin grounded wire toward an overhead charged cloud. This technique is incredibly favorable for various lightning observations for example earth currents, leader developments, related electromagnetic and high-energy radiations etc. because a lightning strike is induced at the desired location. In Japan, a number of rocket-triggered lightning experiments were succeeded in winter thunderstorm seasons.

During the winter of 2017-18, the authors conducted a rocket-triggered lightning experiment in Noto Peninsula, facing to the Sea of Japan in Ishikawa Prefecture. A conductive wire was connected to the rocket and launched at faster than 100 m/s. A rope was also connected to prevent the rocket from rising above an altitude of 200 m. The rod-type ground electrode with a diameter of 1 cm was buried at a depth of 1 m.

We were successful in triggering lightning stroke at 1352:28h December 29, 2017. The two types of Rogowski coils to measure lightning current, hi-speed video cameras, RF antennas in VHF and LF bands were equipped around the striking point. The corona current and e-field were measured at about the distance of 50 m from the point. The measured lightning current was reached to -12 kA and continued for 290 ms. The recorded images with high time resolutions against recorded RF radiations and the current will be demonstrated in this talk.

Keywords: Rocket-triggered lightning, Winter thunderstorm, Lightning current, EM observations

