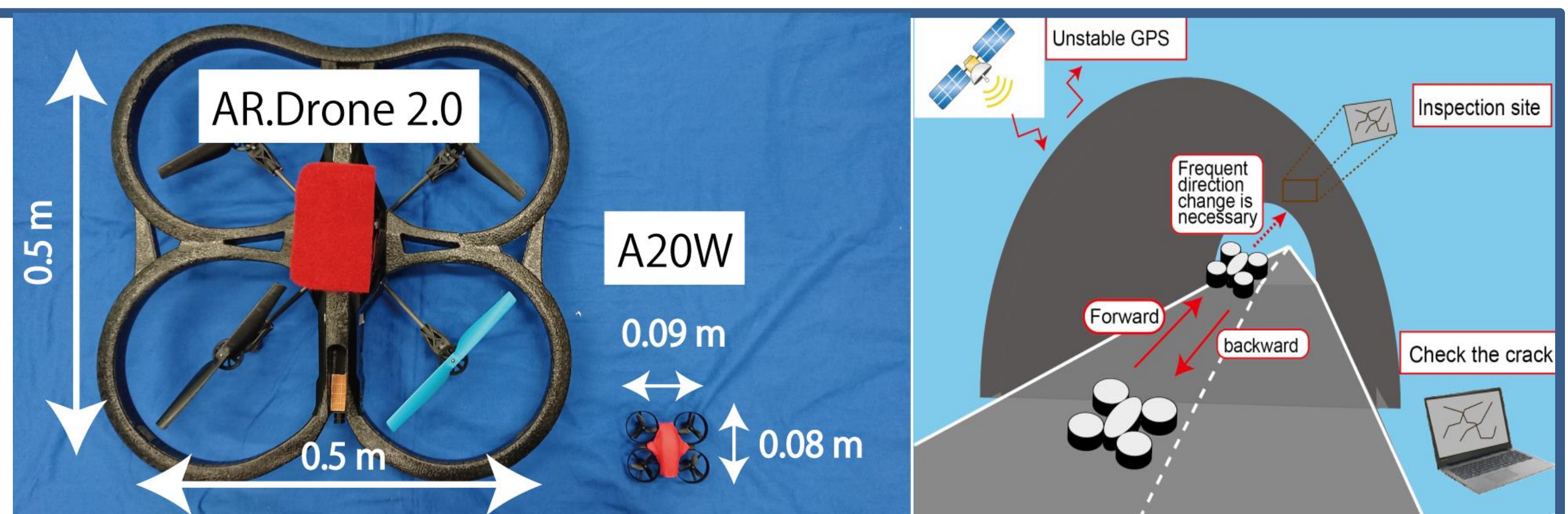


Comparing of long-distance flight control performance of two size four rotor helicopters

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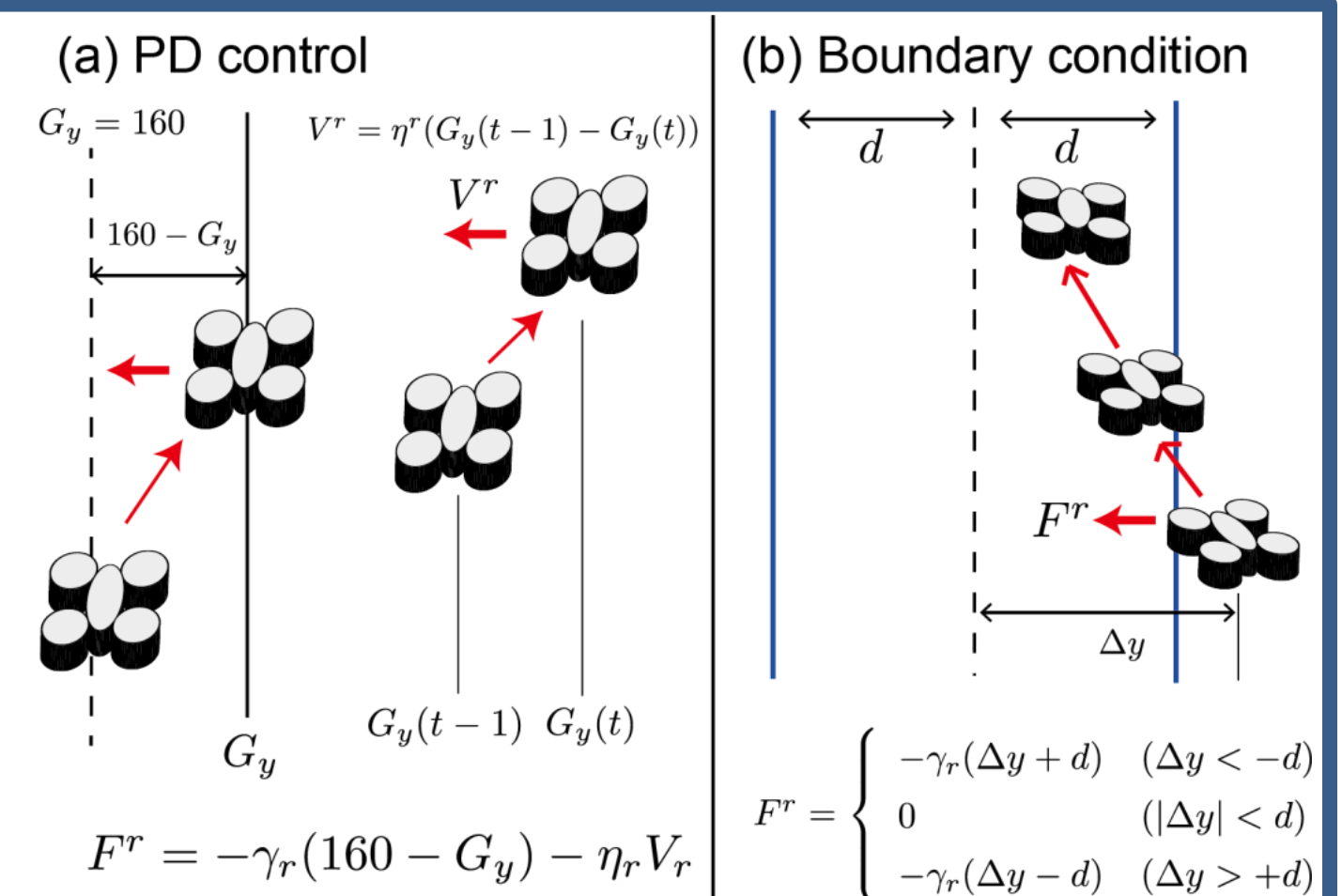
Object

In this paper, long-distance (>10m) movement control experiment of two size of four rotor helicopters were confirmed and the control stability was evaluated in a small size room (4 × 4 m, 3 m height).

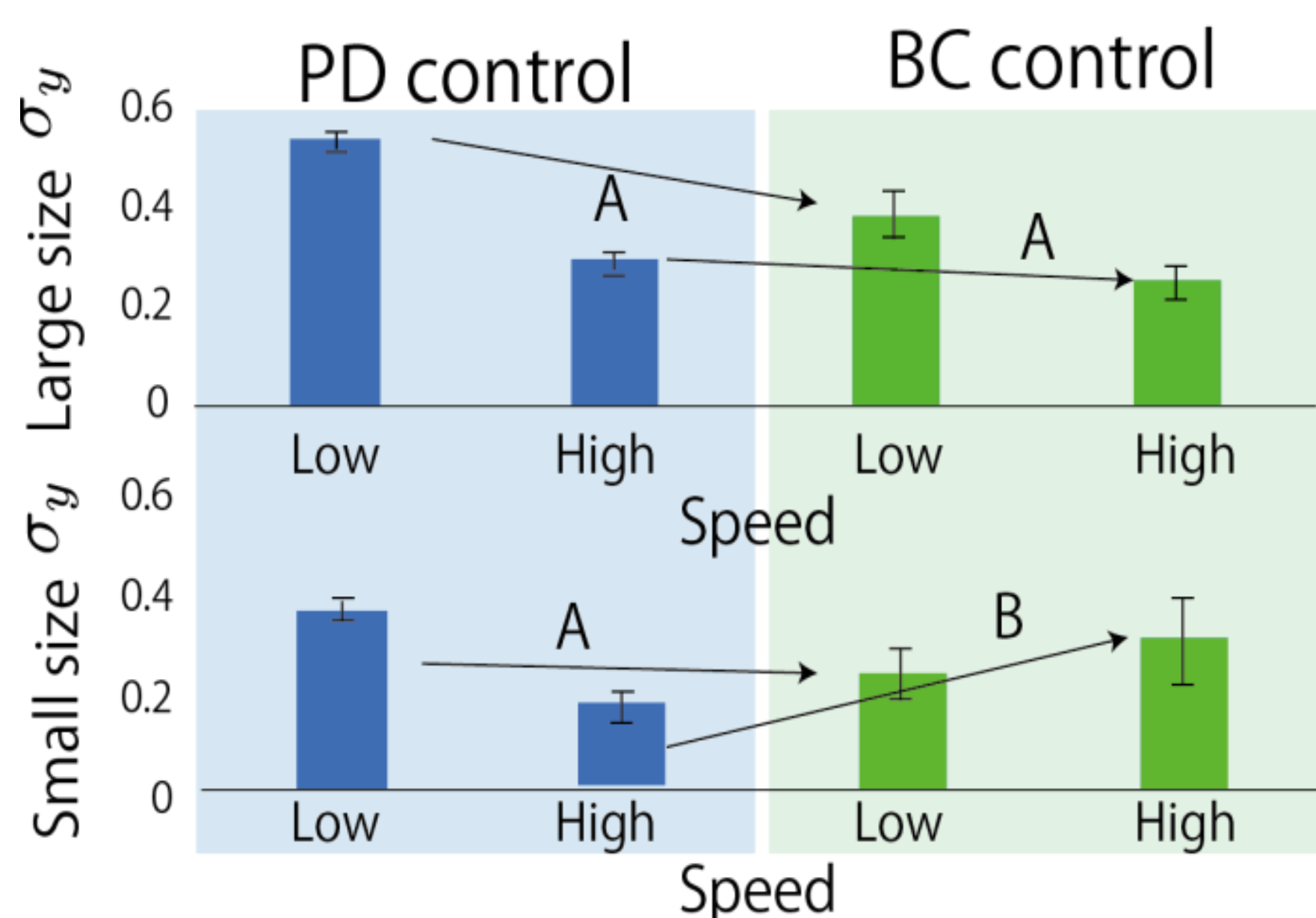
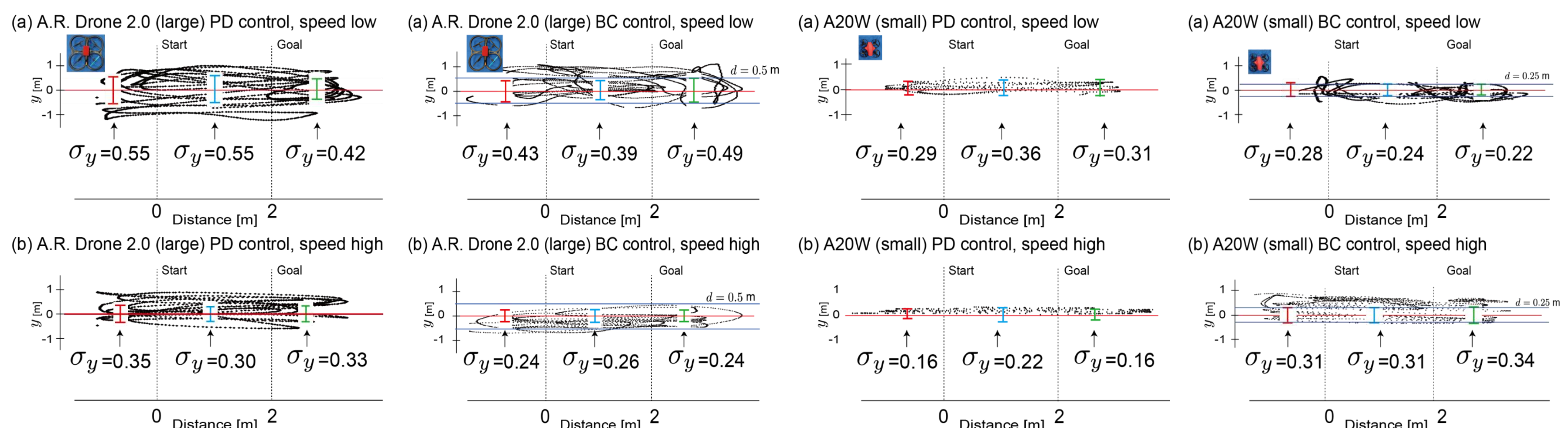


Moving Methods

In this experiment, (1) A.R. Drone2.0 (large size: 0.5 × 0.5 m) of Parrot Corp. and (2) A20W (small size: 0.09 × 0.08 m) of Potensic Corp. were used. By the assumption that a movement control instability is occurred in the movement direction change, an autonomous flight movement control experiment was conducted by including movement direction reversing 10 times with two different velocity speeds and control methods.



Result



Experiment result shows that

- (1) The stability was basically increased in high speed condition.
- (2) The stability of the forward movement of the drone was increased in the small size drone comparing with the large size.
- (3) The stability depend on the kind of controller (PD vs BC) especially in the high speed movement case.

Conclusion and Discussion

- It is necessary to carefully select the size and moving speed of the drone according to the usage scene.
- The size of the red markers is about 1/9th of the size of the larger aircraft, and we believe that the evaluation method needs to take into account the size of the aircraft.