

## &#65279;Study on Unmanned Aerial Vehicles for aeromagnetic survey

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Aeromagnetic surveys by airplane or helicopter were restricted due to the extremely high cost and the aviation laws. We have developed small unmanned aerial vehicles (UAV) with an auto-navigation system by GPS for the magnetic survey in Antarctica during summer season. The first flight was performed at Sakurajima Volcano, using a UAV provided by NIPPI. The UAV was

1.8m length, 2.0m wing width, 0.8m height, and 15kg in weight. An engine was employed of 86cc-2 cylinder and 2-cycle gasoline engine. The takeoff and landing were controlled by radio, but regular flights controlled by auto-navigation system.

The navigation succeeded within 72m of the horizontal deviation during 7 times circular flight in the area 0.5x3.5x1.0x3.5km, although 40m dropped when UAV rotated.

Three component magneto-resistance magnetometer of the sensitivity 10nT was used. The total weight of the magnetometer, GPS and data logger was 400g. The magnetic anomaly with 600nT was observed along above courses. A video camera with SD memory card (190g) was on board to take the volcano at altitude 1400m. It recorded craters and debris barriers on the slope of the volcano,

although visibility was extremely worse due to smock and ashes from the crater. From these measurements we concluded that the aeromagnetic survey with video images can be done by small UAV.