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## Design and development of lightweight dropsondes for the monitoring of fugitive CO<sub>2</sub>-emissions from volcanic regions

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One of the main compounds emitted by volcanoes or volcanic fields is CO<sub>2</sub>. This is not only emitted from localized craters, but can emerge as distributed and fugitive emission from extended volcanic regions. In this situation it is of interest to explore the distribution and horizontal concentration profiles of the CO<sub>2</sub>-emissions.

For this purpose new dropsondes for sensor measurements of CO<sub>2</sub> emissions are under development at the Duesseldorf University of Applied Sciences. These dropsondes are designed to be dropped from aircraft or drones over volcanic areas in order to map the distributed CO<sub>2</sub> concentrations over longer times in an unattended way. They are very lightweight and cheap, so that a large number of dropsondes might be deployed even over remote areas or regions with difficult access. The data are transmitted with GSM broadcasting and can be visualized on a geographical map.

The dropsondes use an NDIR CO<sub>2</sub> sensor as a basis for the measurement unit. Additionally to the concentration of CO<sub>2</sub> the atmospheric pressure, temperature and humidity are measured. The sensor unit is mounted in a special shock absorbing housing, which is designed to absorb impacts from the touch down after dropping of the sensor and is able to resist even adverse weather conditions.

First measurement results and more details of the design of the sensor unit are presented in this contribution.