

49th STUDENT CONFERENCE (E2)  
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O-ZONE: CFCS, PM, NOX, SOX DYNAMIC SAMPLING IN THE STRATOSPHERE

**Abstract**

Air pollution is an increasingly debated and relevant topic; natural disasters such as those that have occurred in recent years define the need to study and intervene for environmental protection. To date, atmospheric studies are mainly satellite-based and static at ground level. O-Zone Team was set up based on this state of the art to encourage technological development regarding dynamic sampling analysis. In this context, the O-Zone experiment aims to study air pollutants of anthropogenic and natural origin through an affordable and easily reproducible device that can quickly intervene in the study of restricted areas. O-Zone is already selected for the BEXUS project, cycle 30-31, to launch on a stratospheric balloon in October 2021. The first step of our experiment consists of collecting, at different altitudes, the atmospheric air, trapping, with a system of filters, the solid particles and various gaseous substances including pollutants as CFCs, PM and combustion products (NO<sub>x</sub> SO<sub>x</sub>).

After the flight of the balloon, we will be able to analyse the samples; thanks to the values of temperature and pressure, in addition to those of altitude, we will not only characterise the composition of the air at each interval, but we will also be able to build dispersion curves and models for each analyte. These would allow us to predict possible reactions in-situ and think of solutions for intervention or prevention. This paper presents the architecture of the O-Zone experiment and an overview of the concept and design of the experiment up to the preparations for the launch campaign. The experiment working principle will be illustrated, along with the design and assembly phases following the typical milestones of a real space mission scenario. Studies about new mechanisms, problem solving and backup solutions will be introduced as part of the lessons learned during the entire programme. Qualification tests will be presented for payload qualification and admission to the final launch phase.