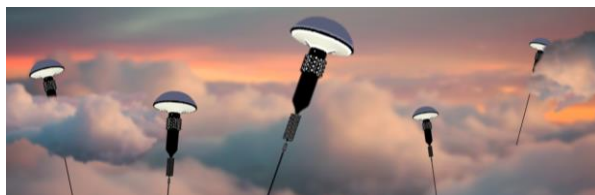


FAKÓS - ATENTS, EYES IN THE CLOUDS OF VENUS

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Phosphine in the clouds of Venus: ALMA and JCMT received a spectrum of 266,9445 GHz wave band from Venus showing a PH₃ absorption line profile against the thermal background of deeper and warmer layers of the atmosphere. Initial detection using the JCMT in 2017 suggested an abundance of ~ 20 ppb, initial follow-up detection using ALMA in 2019 suggested an abundance of ~ 7 ppb [1]. These data have generated certain hypotheses and debates in which it stands out if Venus could host life as we know it or if it is in full evolution.

How to measure this compound: The "Fakós - Atents" sensing system intends to use the electrochemical method to detect the PH₃ compound, since it is the most reliable method, for instance they contain sensors with a system of electrodes, electrolytes and a membrane; when it comes into contact with phosphine, generates a signal that allows its analysis [2]. In addition to being able to be implemented in an autonomous and remote system for the analysis of samples.

Fakós – Atents: This concept is based on the design, manufacture and implementation of a group of independent miniaturized sensor systems, with a maximum volume of one liter and a weight of around 1kg, intended for the detection of compounds and chemical elements present in the environment, mainly phosphine.

Electronics for its operation:

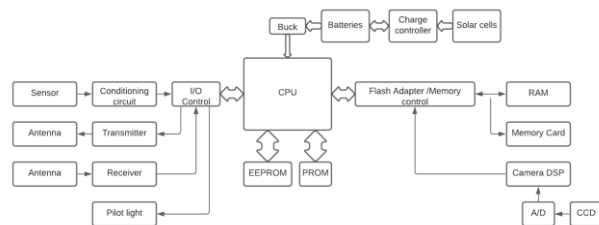


Figura 1. Block diagram, embedded system Fakós - Atents. Source: self made.

Power system: To supply energy to the batteries, flexible triple junction solar panels will be implemented with external protection to avoid deterioration caused by the acidic environment of the Venusian atmosphere.

Lift in the clouds: In order to sustain the "Fakós - Atents" sensor at the cloud level of Venus, it is essential to use Helium gas, furthermore contributing with energy saving throughout the mission. In the table illustrated below, the equivalent in volume of gas is presented to achieve the support of the payload without problem.

Concept			
Element	Mass	Requirement	Value
Payload	1 kg	Volume	1.107 m ³

Table 1. Gas for Fakós - Athens. sustentation Source: self made

Communication system: For the "Fakós - Atents" sensor system to be able to move through the clouds of Venus, its proposed use a double band transponder; These have an X-band transmitter, allowing you to send 8 GHz signals up to the communication relay, and you will also have another omni-directional low-frequency system that will handle the 100 MHz frequencies for sending and receiving data between them regardless of direction. [3].

References:

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