

Detection of earthquakes through a stratospheric infrasound study

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Abstract

To probe the internal structure of terrestrial planets, it is necessary to analyse their seismic activity. The case of Venus presents technical difficulties. With ground temperature of 400 °C and pressure of 90 atm, we are today unable to send long-lasting landers there. A possible solution would be to use atmospheric balloons to analyse the infrasound waves created by seismic activity. Indeed, earthquakes generate 10 Hz sound waves which are amplified during their propagation to the highest layer of the atmosphere. Besides, at an altitude of 50 km Venus presents earthy conditions, which makes implementing such a solution technically possible.

This project aims to prove the effectiveness of this method by testing it on Earth. The main challenge will be to characterize the infrasound atmospheric background noise, to be able to accurately detect and locate infrasound perturbations.

This project is being developed by a team of researchers from Supaero, JPL and Caltech. We bring the participation of École polytechnique.