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PROJECT AGORA: SIMULTANEOUSLY DOWNLOADING A SATELLITE SIGNAL AROUND THE
WORLD**Abstract**

The Ecuadorian Space Agency has recently provided the civilian world with an internet-to-orbit gateway (HERMES-A / MINOTAUR Space Flight Control Center) available for public and educational use. This gateway connects internet users around the world with the capability to remotely operate and listen to a satellite ground station, providing a broad platform for educators and amateurs to connect to LEO orbiting satellites live and from their own computers.

Around this gateway, Project AGORA was established as a user community such that knowledge, assistance and training could be shared among common users. Because of this connectivity, users around the world can simultaneously control and download realtime signals from satellites passing over Ecuador, passing control of the station off to each other as each user learns how to operate the system. This paper will detail the operations of Project AGORA and the results of simultaneous connections from users around the world; North America (Michigan), South America (Ecuador), Europe (Graz-Austria), and Asia (Japan) as they worked together to connect to passing satellites.

From user studies, it has been deduced that there is direct link between synchronization losses and number of simulation programs running with high priority. Moreover, the use of Satellite Toolkit simulations in observations significantly improves all real time results. Results of these studies are presented within this paper.

The ground station has a maximum range of tracking and detection of 22000 km and a sensitivity such that satellites with an output of 0.2 watts can be received; the most sensitive array in the region. The station is capable of relaying signals between any computer on the Internet and spacecraft in orbit using one of the four modes of operation, from passive signal listening, to active voice interaction. Each of these modes will be detailed along with usage characteristics and results.

Finally, this paper will detail the February 5th, 2010 near-miss collision between Iridium-33 34891 debris and the SwissCube cubesat. During this event, the HERMES gateway was a key ground station and relayed live data directly to the EPFL SwissCube center.