

Lightning mapping sensor will provide scientists with unique stereo view

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With the scheduled March 1 launch of a new weather satellite, scientists at The University of Alabama in Huntsville (UAH) are looking forward to getting a unique stereo view of lightning in storms over the United States.

"We are very interested in comparing the two. For example, it will be important to understand the circumstances when we see lightning in one instrument but not in the other," said Dr. Hugh Christian, a research professor in UAH's Earth System Science Center and the leader of UAH's lightning research group. "We'll have a very good stereo effect."

The GOES-S [weather satellite](#), scheduled for launch on Thursday, carries a Geostationary Lightning Mapper (GLM) identical to the GLM instrument that was carried into geostationary orbit aboard the GOES-R (now GOES-16) weather satellite in November 2016.

Each GLM is designed to watch for lightning over most of the Western Hemisphere. Its cameras collect 900 million pixels of data every second, looking for the sudden and significant change in brightness in one pixel or small cluster of pixels that might signal a lightning flash in a storm deep in the Earth's atmosphere.

A piece of hardware designed and built at UAH picks up those events and formats the data for transmission to Earth, where software (also developed at UAH) decides whether each event is lightning or a false alarm caused by such things as sunlight reflecting from a white cloud top

or high energy radiation hitting the CCD.

Once that is done—in near real time—the lightning data are used by forecasters to track storm systems as they move, grow and ultimately die.

GOES-16 has been tested, deemed ready to be put into service and moved into place over the eastern portion of the U.S.

"It's worked really well," Christian said of the first GLM. "It's going to exceed all of its performance requirements. There are still some issues with ground-based processing. We've got to remove the chaff from the wheat, but it performs pretty much like we expected it to."

While it is being tested and readied for service as GOES-17 over the western U.S. and the eastern Pacific Ocean, GOES-S will be parked at 90° west.

"Once it is moved to its permanent location over the west coast, we will have instrument coverage from the edge of New Zealand all the way to the western edge of Africa," Christian said. "It'll be pretty awesome."

Christian and other scientists hope to use the lightning data from GLM to study severe storms. For instance, they want to determine how much energy is dissipated by [lightning](#) and how that fits into the overall evolution of storms.

Provided by University of Alabama in Huntsville

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