



Stories of Success

Dielectric Model of Tundra Soils Developed



Researchers from the [Kirensky Institute of Physics](#) in Krasnoyarsk, Russia, and the [University of Michigan](#) have created a physics-based model of the dielectric properties of tundra soils at microwave frequencies and over a wide range of temperatures.

According to [Roger DeRoo](#), an assistant research scientist with the [Department of Atmospheric, Oceanic, and Space Sciences](#) at the [University of Michigan](#) and the U.S. principal investigator for this project, this model is fundamental to enabling satellite observations to reveal information on such Arctic land surface processes as moisture and heat fluxes between permafrost soils and the atmosphere.

“We’ve produced an accurate model of the dielectric properties of certain tundra soils,” says DeRoo. “Until now, the scientific community has been using dielectric models developed for temperate soils, which are very different.”

As part of this research, [Valery Mironov](#), who is a senior scientist and the head of the Kirensky Institute’s Laboratory of Radiophysics of Remote Sensing and the project’s foreign principal investigator, and former graduate student Igor Savin, now an engineer at the laboratory, discovered a previously unknown state of water that appears in tundra soils at temperatures below -6 C. The researchers are formulating hypotheses to better understand this state of water.

The project will be featured in the forthcoming proceedings of the IEEE International Geoscience and Remote Sensing Symposium held July 23-27 in Barcelona, Spain.

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