A sensor that allows vehicles to detect road conditions

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Researchers from the Universidad Carlos III de Madrid (UC3M) have developed a sensor and a method for detecting road conditions while a vehicle is moving.

This innovative sensor warns of the presence of water, ice, snow and other obstacles on the road, as well as using this data to calculate the lack of surface grip. The aim of this device is to increase safety while driving and prevent accidents once integrated into motor vehicles.

This sensor works by using reflectance spectroscopic techniques, that is, using light beams and photodetectors to analyze the vehicle's surroundings. "Our sensor is based on a double-frequency optical comb, optical means for directing the comb's output beam, a photodetector and a receiving optic," explains Marta Ruiz Llata, Ph.D. in Electrical, Electronic and Automation Engineering at UC3M. Based on the light signal received, this electronic photodetector analyzes the radio frequency spectrum of the detected signal and translates it into a visible image of the condition of the road.

Until now, other techniques and models for detecting the condition of the asphalt already existed; the novelty of this innovation is that it allows real-time recognition. "Other systems that use more than one emitter with different wavelengths can't be used to measure road conditions with a moving vehicle, since the required integration time is too long," says Pablo Acedo Gallardo, Ph.D. in Telecommunications Engineering at UC3M.

Provided by Carlos III University of Madrid

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