
CW S-Lidar as an Advanced Remote Sensor with Range-Imaging Photonics

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In the last years, lidars as optical sensors for laser remote sensing have found more and more applications. Among a variety of lidar systems, continuous-wave range-resolved S-lidars (S comes from Scheimpflug) have established themselves as a recent but very promising type of laser sensors. A distinctive feature of S-lidar-based remote sensing is the introduction of new principles of transceiver design, which we called range-imaging-photonics solutions. They use low-power CW diode lasers and triangular range control combined with unconventional depth-of-field extension technique and position-sensitive detection. All of this is based on recent advances in micro-optics and nanophotonic technologies.

The purpose of this paper is to give an understanding of the operation principle, advantages and prospects of a new class of lidars and to show what new niche S-lidars occupy among common approaches and types of laser remote sensors. The specificity of S-lidar design is considered as an integration of non-traditional approaches and modern technologies. Characteristics and features of common lidar types are compared with those of S-lidars. Finally, we explain the advantages of using S-lidars in various fields due to the greater informativity of S-monitoring over traditional lidars.

Short Bio:



Ravil Agishev received his DSc and PhD degrees in Information Processing and Control Systems and a Full Professor title from Kazan National Research Technical University n.a. Tupolev, Russia. He is a professor of Kazan State Power Engineering University, Russia. He has a long-term research and academic experience in Laser Remote Sensing (LRS) systems development and applications, including Lidar system design and simulation; remote identification and functional environmental diagnostics; lecturing and supervising PhD and MSc students in the field of LRS.

