

# Multiangle Video Polarimeter for Optical Range of Medium Spatial Resolution

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**Abstract.** The main limitation for the widespread introduction of passive video polarization methods for remote sensing of underlying surfaces is their increased sensitivity to the angular conditions of observation. At the same time, it is the angular dependence of the parameters of the Stokes vector or their functionals, the degree and the azimuth of polarization, which is called the polarization-phase curve (PFC), that serves as the "polarization signature" of the research object, since it contains exhaustive information about the optical properties of the object and is associated not only with its physical and mineralogical composition, but also with the microstructure of the surface. However, the dimension of the PFC does not allow displaying it as two-dimensional images, which makes it difficult to perform a joint decoding of the traditional spectrozonal and polarization images. The possibility of reducing the dimension of the polarimetric information is due to the relative smoothness of the PFC, which has a limited number of extrema. Therefore, the restoration of the shape of the PFC can be ensured by several angular readings. At the same time, to categorize objects according to their optical properties, it is quite sufficient to use not the actual PFC, but only a number of their characteristic features, such as, for example, the absolute values of the "positive" and "negative" maximum of the degree of polarization, the polarization azimuth inversion angle, etc., which are also invariant to the angular conditions of observation.

**Keywords:** multiangle video polarimetry, Stokes vector parameters, polarization-phase curves, remote sensing of the Earth, the Moon and Mars