

INFRARED NEAR FIELD SCANNING OPTICAL MICROSCOPY BASED ON SILVER HALIDE FIBERS

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Mid-IR spectral range is of a great interest in many fields, such as thermal imaging, spectroscopy, and radiometry. Lens-based optics limit the spatial resolution of the existing microscopes to the order of a wavelength, due to the diffraction. Scanning near field optical microscopy, on the other hand, enables measurements with spatial resolution below the diffraction limit. In this talk, the development of aperture-based tapered probes from silver halide optical fibers for application in scanning near field microscopy in mid-IR spectral range will be presented. The probes were characterized both in the collection and illumination modes of operation using monochromatic sources of radiation. We discuss the radiation profile from sub-wavelength apertures, and present the application of the probes in IR-imaging and radiometric measurements. In addition, we discuss the current state of affairs of spatial resolution and achievable and signal-to-noise ratio in conventional FTIR spectroscopy using global and synchrotron broadband sources.