

# Fiber-based infrared heterodyne technology for the PFI: Development of a prototype test system

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© 2018 SPIE. We present the concept and experimental development of a low-cost near-infrared heterodyne interferometer prototype based on commercial 1.55  $\mu$ m fiber components. As the most crucial component of it we characterized a novel sub-shot noise correlation detection system. We

are upgrading to a Reconfigurable Open Architecture Computing Hardware, 2nd Generation (ROACH-2) board with the capacity of four parallel 1.25 GHz bandwidth digitization, so that phase closure measurements will be possible. We extended the stabilization of the local oscillator phase between the telescopes to cover the whole acoustic range. For the telescope to single-mode fiber coupling under atmospheric perturbation, we developed a fiber actuator lock-loop for small telescopes and good seeing, and tested an adaptive optics approach for mediocre seeing and/or larger telescopes. We constructed also a frequency comb based laser synthesizer system to include tests on multi-frequency band measurements towards u