

## **199 Single-shot hyperspectral interferometry: From astronomy instrumentation to surface profilometry and depth-resolved deformation measurements**

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Surface profilometry techniques such as coherent scanning interferometry or focus variation require long scan times and are thus vulnerable to environmental disturbance. Hyperspectral interferometry (HSI) overcomes the problem by recording all the spatial and spectral information necessary to reconstruct a 2D surface height map in a single shot. In this paper, we present new HSI systems based on arrays of micro-optics elements inspired from astronomy instrumentation to provide the necessary gaps for the spectral information. 2500 independent channels are demonstrated, with a maximum unambiguous depth range of  $\sim 825 \mu\text{m}$  and tolerance to a surface tilt angle of  $33.3 \text{ mrad}$ . The use of phase information allows height to be measured to a precision of  $\sim 6 \text{ nm}$ . The system is used to measure maps of surface profile, depth-resolved displacement and surface roughness.