



# Laser-FALCONEYE deformation & stress camera



FIELD OF VIEW				
Basic value		85 mm x 85 mm		
Extendable to (x5)		425 mm x 425 mm		
	SPATIAL RESOLUTION OF MEASURING POINTS			
	Basic value		0,5 mm	
		Extendable to (x1/100)		0,005 mm





#### I. DEFORMATION DISTRIBUTION MEASUREMENTS

#### I/A. LOADFREE (OR COLLATERAL) DEFORMATION

1. At clamping, fastening

2. After manufacturing processing (e.g. at etching, drilling, welding...)

3. After use (e.g. aging, fatigue...)

4. Change with time (e.g. shrinkage, swelling...)

/e.g. non-metallic examples: plastics, and even rocks.../

#### I/B. OPERATIONAL LOAD DEFORMATION

#### I/C. TEST LOAD DEFORMATION - for revealing localized material flaws

Inner structural inhomogeneity (e.g. at sandwich structures...)
Inside material deficiency (e.g. at corrosion...)
Bonding flaws (e.g. at welding, gluing, coating...)
Crack propagation analysis

# Laser-FALCONEYE deformation & stress camera

## **II. STRESS DISTRIBUTION MEASUREMENTS**

/through stress-release deformation distribution at diagnostic semi-nondestructive blind-hole-drilling/

#### II/A. LOADFREE: RESIDUAL STRESS

1. In finished product - or after use

2. After manufacturing processing (e.g. etching, drilling, welding...)

- 3. In raw material (e.g. from casting, forging, rolling...)
- 4. In preprocessed raw material (e.g. heat treatment, coating...)

#### II/B. OPERATIONAL LOAD and FULL STRESS

- 1. Critical values and hot-spots
- 2. Homogeneity discrepancies
- 3. Load transfer between components
- (e.g. at free contact and at welding, gluing, coating...) 4. Change with time (e.g. at *relaxation*...)

#### II/C. TEST LOAD STRESS - for revealing localized material flaws

Inner structural inhomogeneity (e.g. at sandwich structures...)
Inside material deficiency (e.g. at inner corrosion...)
Bonding flaws (e.g. at welding, gluing, coating...)



# Laser-FALCONEYE digital-holographic gauge-camera

for

## 3D surface measurement of

## **DEFORMATION DISTRIBUTION**

## with submicron sensitivity

and what can be calculated from it: **STRAIN & STRESS** /DEFORMATIONAL STRESS\*/

+

## 2D surface measurement of

## STRESS DISTRIBUTION

/**RESIDUAL** and FULL STRESS\*/ with principal stress directions and values



# Laser-FALCONEYE HOLOCAMERA 2017/2018 CURRENT STATUS















Laser-FALCONEYE HOLOCAMERA 2017/2018 CURRENT STATUS











Distortion distribution at the receptive component of a "self-righting" free contact: "cone outside – sphere inside" surface pair



Residual stress distribution at selected points of stress-scanned aluminum steering bush













to validate simulation results (wherever needed)

to replace empirical scales by simulation (wherever calculable)