



Universidad  
de Alcalá



## NOVEL FULL FIELD 3D DISPLACEMENT MEASUREMENT DEVICE

**Patent**  
ES2498592

**Code**

TRANSP\_UAH\_03

### Application areas

- Industrial Manufacture, Material and Transport technologies
- Measures and standards



### Type of Collaboration

- Agreement of "Joint Venture"
- License agreement

### Main Researchers

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### CONTACT



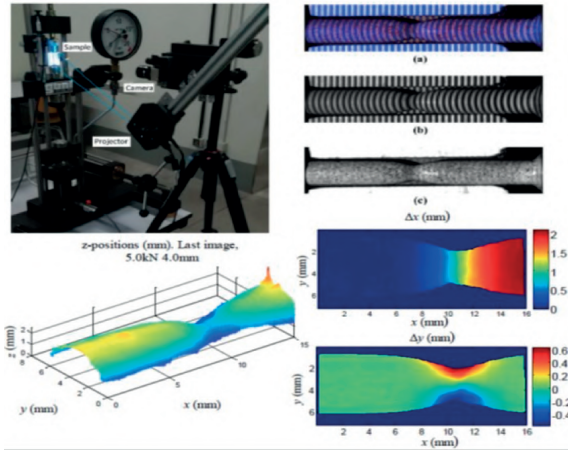
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### ABSTRACT

It is proposed to further promote the implementation of an alternative technique for measuring 3D displacements in the industries and research centers and, eventually, develop a commercial device. It is a low cost alternative technique to 3D Digital Image Correlation (3D-DIC), used for evaluating the mechanical performance of new designs and materials under real working conditions.

The alternative proposed system combines the two techniques of Fringe Projection and 2D Digital Image Correlation (FP+2D-DIC). It allows measuring large areas and displacements of surface elements in the three spatial direction (from which the corresponding deformation maps can be calculated).

Measurements are acquired in real-time but the sample surface must be painted with a random speckle pattern.

The main advantages of FP+2D-DIC in comparison to 3D-DIC: requires one camera in addition to a fringe projector, processing algorithms are much more simple and less expensive, especially for high speed measurements (since it uses only one camera). However, the camera that uses FP+2D-DIC has to be RGB.

Sought cooperation types:

- Financial support for further improvement of the FP+2D-DIC,
- Industry interested in testing the equipment
- Commercialization of the equipment.

### ADVANTAGES AND INNOVATIONS

- The device developed for the combined FP+2D-DIC technique is unique and has already provided results comparable to the one obtained with the commercial alternative technique of 3D-DIC.
- The improved FP+2D-DIC device will increase its performance by using new equipment (mainly a special camera and fringe projector) as well as by implementing new image processing algorithms that already have demonstrated to increase performance beyond the one offered by the commercially available 3D-DIC equipment.

The FP+2D-DIC device has been a result of collaboration between two universities, the Universidad of Alcalá and the Universidad of Jaén.