MR SENSORS ARRAYS FOR EDDY CURRENT TESTING

ABSTRACTS

Eddy Current (EC) Technique is a powerful method for detection of surface notches and of buried flaws during inspection of metallic parts. This technique is used for inspection of aerospace components. Classical winding coils are the most commonly used EC sensors. Nevertheless, when the size of flaws decreases or the defect is rather buried deep inside the material, traditional winding coil probes turn out to reach their limits. For this reason, other technologies are investigated to improve this technique.

Magnetoresistive sensors present the advantages of flat frequency response and dimensions at the micron size. These sensors are hence very attractive for the detection of buried defects that require low frequencies because of skin depth effect. Also, they are suitable for small surface defects due to high spatial resolution because of their manufacturing down to μm without losing their field sensitivity. In addition, several magnetic field components can be simultaneously detected for a better analysis of defects.

We will present last advances of MR based probes containing arrays of GMR- (giant magneto resistance) and TMR-elements (tunnel magneto resistance) with comparison of experimental datas and simulations on Aluminium and Titanium mock-ups.

We will discuss the input brought by the development of ASIC components for compact probes and paths to develop probes adapted to complex geometries.

KEYWORDS

MR sensors | Eddy current |