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# Special Issue on Composites and Aircraft Materials
# Editorial

The International Symposium on composites and aircraft materials (ACMA 2007, May 22–24, Agadir - Morroco) is the incubator for the emergence of the field composites metals and polymers. Complementary techniques and application of structures and materials will be discussed with NDE. This event will be developed one of the important events discussing the monitoring of structural integrity and adaptive/intelligent structures. This symposium offers new avenues for collaboration and interaction opportunities to bring more advances and address greater challenges that lie ahead. Such challenges include areas of aeronautical safety, and benefiting from other exciting fields of aeronautics, composites, metals, polymers and others.

When in service, aeronautical structures are subjected to requests which fluctuating over the course of time. Let us quote for example pressurization of the fuselage, pilot operations, and atmospheric turbulence... Experiments show that the repetition of cycles of effort modify and degrade the properties of materials and can lead, in the long term, to the rupture of certain parts. This phenomenon is usually called "fatigue" or "damage by fatigue". It can appear in relatively low levels of constraint and lower than the elastic limit of the material. In the aeronautical field, fatigue occurs in general without overall plastic deformation but with very localised plastic deformation around the accidents of form (notch, boring, fillets...) the phenomenon of fatigue must be taken into account in structural design.

The difficult issue that aircraft manufacturers must deal with is that of the necessary compromise between the economic requirements (highest possible lifespan, lowest possible structural mass), the technical requirements (availability and intrinsic performances of materials, technology, implementation, drawing, etc.) and the legal requirements (behaviour of a structure under extreme loads, maintenance of navigability...). The choice of good materials has a very particular importance. For a long time it was believed that that it was necessary, above all, to seek materials with a resistance to the highest possible deformation. Then, gradually, materials presenting a better compromise between resistance and tenacity or more generally ductility are being sought. In addition, oversizing is not a good solution. Thus, light alloys are frequently being used in aircraft structure.

The conference will bring together emerging technologies and advanced research in instrumentation, sensing, and measurement science with progressive management and diagnostic approaches and composite materials behaviour. Engineers and researchers from government, military, academia and the commercial sector will discuss the current status and future directions of structures and materials, NDE, and health monitoring. Case studies, emerging research agendas, and innovative new technologies will be presented.

This meeting is a showcase for multidisciplinary research and provides an excellent opportunity to explore new research areas by teaming with new partners from fields other than your own. A selection of communications constitutes this special issue.

The Guest Editors:
M. Karama, A. El Hami, A. Menou, A. Mouden

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