Postdoctoral fellowship : Durability of adhesively bonded joint.

Research field : Mechanics, Material behavior, Adhesive bonding, Experimental mechanics

Context : DURECO project / Durability of bonded structural repair

Adhesive joining technique now tends to replace traditional assembly methods such as bolting, riveting and welding. Indeed, structural bonded joints often show superior mechanical performances such as higher strength better durability thus leading to significant weight saving combined with cost reduction. However it still suffers from strong limitation regarding drastic reduction of lifetime and strength when exposed to aggressive environment (high temperature, humidity, …). To face this issue important margin of safety are applied when designing bonded joint exposed to combined mechanical loading and environmental aggression. In this context, developing physicaly based models to describe the progressive damage of bonded interface under such condition would lead to a more reliable design of bonded joints. The DURECO program involves both IRDL (ENSTA Bretagne, Brest) and ICA (ISAE, Toulouse) laboratories which aims to develop experimental and numerical tools for describing slow rate crack propagation along bonded interfaces facing stationary loading and environmental exposure conditions. In the frame of the present project, these law will be implemented to evaluate numerically the durability of panel structural repair (either metallic or composite) but could be used for any structural bonded joints.

In IRDL Laboratory, the candidate will be in charge of developing new test protocols and experimental arrangement to monitor the slow rate crack propagation along bonded interface loaded under mixed mode conditions and suffering from aggressive environmental exposure. Besides, he will conduct all mechanical analysis needed to extract from the experimental data the laws that describes an intrinsic manner the behavior of the bonded interface.

Consortium : The candidate will be host at ENSTA bretagne, in IRDL laboratory in the frame of a cooperative program with ICA laboratory (ISAE / supaéro) and funded by l'AID (agence innovation défense).

Candidate skills :

The candidate must develop strong skills in experimental mechanics and metrology applied to the characterisation of structures and material behavior (mechanical design, DIC …). Additional skills in composites materials behavior, fracture mechanics, structural joining would be appreciated.

Duration : 2 years **Suggested salary:** ≈2000€/month depending on expertise

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Send updated CV & motivation letter.