## Sujet : Influence of hydrogen and inert gases on the tribological behavior of carbon composites and solid lubricants for aeronautical applications. Responsable : Hamid Zaidi

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The tribological behaviour of solid lubricants is not an intrinsic property. It depends on the gaseous environment and humidity around the tribocontact. The influence of ambient gases such as oxygen, nitrogen or water vapour on the friction and wear behaviour of lamellar materials such as graphite, molybdenum disulfide MoS2, has been extensively studied. However, the tribological behaviour of these materials under helium, cryogenics or molecular hydrogen, which could be the fuel of the future, is little studied.

The study consists of dry friction and fretting testing of carbon composites and other solid lubricants such as graphite and molybdenum disulfide, under hydrogen, helium and cryogenic nitrogen for aeronautical applications.

The experimental tests will be conducted on a tribometer installed in a secondary vacuum chamber (10-5Pa), which can be under a controlled gaseous environment. The materials tested will be characterized by microscopy, X-ray diffraction, scanning electron microscopy (SEM) (EDS) and spectroscopy.