

Proposition de Project Lab de M1 2019 - 2020

Nom de l'Equipe d'accueil de l'I.C.B. : PMDM/M⁴OxE

<p>Title</p>	<p>Special Tribometer design improvement and friction coefficients measurement</p>
<p>Research context</p>	<p>The aim of this study is to feed with experimental data the numerical simulations of high-energy ball milling process. The high-energy ball milling process uses the kinetic energy of steel balls to produce metallic or composite alloys starting from precursor powders. Thus, super-saturated solid solutions, high density of dislocations or/and nanostructured alloys can be obtained with particular properties.</p> <p>Recently a lab tribometer for particular geometric configurations was developed and built in the M⁴OxE. Some improvements for the structural parts can be done to assure higher stiffness in order to allow the use of higher loads. The student job will be to improve the design (relatively simple design is to be made) and to supervise the fabrication of parts by the technical staff of the lab. The tribometer have to be tested in different configurations and the collected data have to be analysed in order to extract the static and dynamic friction coefficient. Comparisons with other tribometer results have to be done. Several types of balls, vials and friction media will be used. Several wear conditions (after service) for balls and vials will be considered in order to measure the variation of the friction coefficients within time during the milling process.</p> <p>Also, parallel measurements to extract the energy restitution coefficient of steel balls / steel vial impact are proposed.</p> <p>The student will deal with bibliographic study, experimental work, numerical design, data acquisition and post-processing. If enough time, the student will participate to numerical simulations.</p>
<p>Objectives</p>	<p>Improve tribometer design. Measure static and dynamic friction coefficients. Measure energy restitution coefficients after impact.</p>
<p>Main skills</p>	<p>Simple design skills, experimental measurements, data acquisition and processing.</p>
<p>Supervisors</p>	<p>Virgil Optasanu, Olivier Politano virgil.optasanu@u-bourgogne.fr, olivier.politano@u-bourgogne.fr</p>