Laboratoire des Solides Irradiés in Ecole Polytechnique is searching for a candidate for a 6-month internship, entitled “Investigation on influence of treatment of PVDF polymers to improve the piezoelectric response ".

Piezoelectric effect has become a great interest of research groups dealing with energy harvesting. Within the partnership with other universities and industry we are working in innovative applications e.g. stimulator of heart beat, replacement of traditional batteries or aircraft parts.

Poly(vinylidene fluoride) is known from its piezoelectric properties. The PVDF composites have recently emerged as excellent candidates to fabricate flexible and small piezoelectric generators for portable devices. However, there are still some room to enhance its piezoelectric response. The study performed in LSI clearly showed that the aim was reached by particular treatment such as irradiation (Swift Heavy Ion and/or e-beam irradiation) and embedding metallic nanowires in the polymeric template. However, it should be taken into account that these treatments influence the crystallinity, elasticity and fragility of polymer foil.
The intern will mainly focus on mathematical and physical description of piezoelectric signal and investigation the mechanical properties of polymer such as tensile test. The objective will be also to study deformation of foil during the piezoelectric test.

At LSI and ENSTA, the candidate will have access to different experimental set-ups allowing notably measurements of the piezoelectric voltage output and tensile test. He/She will benefit of an existing collaborative network with other engineer schools (ENSTA, CentraleSupelec). The stage will be done within project Nanovibes 2020-2024.

The knowledge in writing in Python and MatLab will be in plus.

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