

Purpose: M2 Internship

Subject: Neutrons detection in an experimental plasma related to lightning

Due to global warming, the number of violent meteorological events, especially thunderstorms, will not stop growing. There is currently an average in France of around 450,000 lightning strikes on the ground per year. These impacts constitute a real threat to goods and people.

Although lightning has been observed since a long time, the physical phenomena that govern it are only partially known. Therefore, the LPC (Environment-Energy-Health pole) has produced specific equipment in order to simulate the physical phenomena associated with lightning in the laboratory and to study the associated production of ionizing radiation, particularly the neutrons production.

Due to the extremely intense electromagnetic emission of a plasma discharge, it is very difficult to envisage using electronic systems to detect these neutrons. The use of passive detectors made of specific polymer is a viable solution. Consequently, it is in this context that the internship subject is proposed as follows:

- Bibliography about the use of polymers for neutron detection.
- Establishment of the experimental protocol for the neutrons detection in a plasma discharge.
- Experimentations at the LPC laboratory and interpretations.
- Proposed reactions scheme to produce thermal and fast neutrons



Lightning on Clermont-Ferrand
(<http://www.jonathanlamarche.fr/>)



Lightning experiments at LPC

Supervisor & contacts

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