

Context

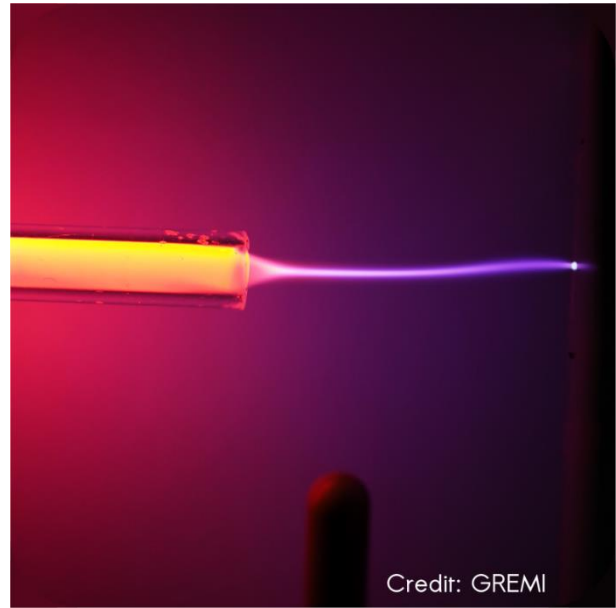
The design of plasma involves the measurement of electric fields from few kV/m to few MV/m involved in the ionization process of a gas which contains charged particles.

The measurement must be very close (few mm or even less than 1 mm) for a cold plasma to a longer one (few tens of centimetres) for a warm plasma.

The transient evolution of the electric field associated to a plasma is very complex.



Representation of the amplitude of an E-field measurement in time-domain



Credit: GREMI

Existing technical E-field measurement

Up to now, the plasma may be measured via the following possibilities:

- Measurement of the power supplier voltage (very limited information obtained)
- Measurement of the electric field with a Langmuir probe (only the average values may be obtained from electronic density or from the plasma potential)

In addition to these measurement solutions, simulations may be calculated but the accuracy of the results are very limited.

Targeted markets

Any manufacturers of cold plasma in the following domains:

- Research
- Medical
- Agriculture
- Semiconductors

Proposed solution by Kapteos

To allow a comprehensive measurement of the electric field of a cold plasma in air or even within a liquid, the Kapteos solution is, at the date mentioned in this document, the only available solution.

The electro-optic solution presents the best possible measurement system thanks to:

- A non-invasive measurement (no metal part)
- A near vector E-field measurement (phase and amplitude)
- A transverse spatial resolution < 0.5 mm
- An ultra-wide band frequencies
- A very compact design (5 mm * 35 mm)
- A wide operating temperature (0 ... +50 °C)
- The possibility to measure very high fields (up to several MV/m)

Customer advantages of using Kapteos solution

A detailed monitoring of the E-field, leading to a high quality and performances of the plasma.

Kapteos references

- University of GREMI lab. at Orléans (FR)
- Institute of INP at Greifswald (DE)
- University of Minnesota (MN - USA)
- Laboratoire de Physique des Plasmas (FR)
- Old Dominion University (VA - USA)