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A development of the Hybrid Sensor for the detection of the High Frequency Partial Discharge (HFPD)

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In general, CT and Shunt have been traditionally used as a sensor for detecting the partial discharges in order to diagnose the present insulation state of the electric power apparatus. The former is very convenient for the practical application since it is not only non-contact method but its frequency bandwidth and resonance frequency could be designed for its specific application. However, it has been proved to have poor linearity and low sensitivity. For the latter, even though it is an ideal sensor, noise from the power source and the ground could flow into the system. Furthermore, the surge current could be easily come into the measuring systems giving rise to a severe breakdown.

In this respect, a hybrid sensor has been designed and fabricated in order to overcome the shortcoming of these two types of sensors. For this purpose, the experimental comparison with commercialized products has been also carried out. In this concept of the hybrid sensor, two different impedances could provide the passage of the signals. In this way, the discrimination of the noise could be accomplished very effectively with high ratio of signal over noise(S/N) under the little influence from the external noises and the breakdown.