

## **Experimental and Theoretical Analysis of the Electromagnetic Environment in the Vicinity of Two 220Kv Power Lines**

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**Abstract :** This work presents an experimental and theoretical characterization of electromagnetic environment in the vicinity of EL-HADJAR high voltage substation located in the eastern Algerian within a very high populated zone. There have been analyses on the effects of electromagnetic fields emanating from coupled multi-lines power systems on the health of the workers and people living in proximity of substations. An experimental investigation has been conducted around a circuit of two 220Kv lines running in parallel. The experimental results are validated by a flexible code of calculus developed in the environment Matlab. The implications of the results are discussed and are in very good agreement with the ICNIRP reference levels for occupational and non-occupational exposures. In a case of study, the separation between the two structures "S" is varied to demonstrate its influence on the electric and magnetic charges quantities generated by the circuit of lines proposed. It is found that increasing S decreases the electric and magnetic fields which occur at the center of the structure then reduces the coupling between lines. We concluded that the evaluation of the spacing between the phase conductors is of paramount interest in the preparation of the line's implantation inside the electrical posts to reduce them radiations in the environment.

**Keywords :** low frequency, electromagnetic fields, electromagnetic coupling, high voltage power lines

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