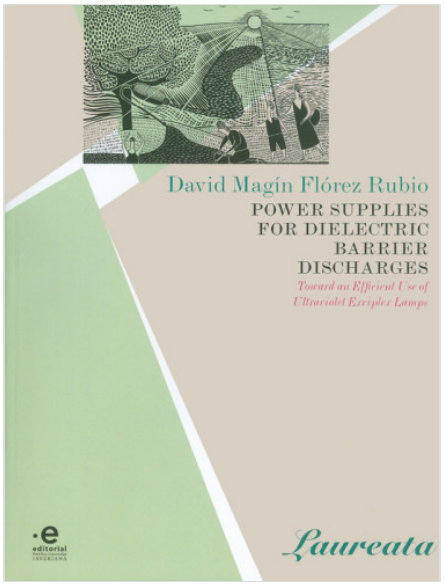
Power supplies for dielectric barrier discharges



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Sinopsis

The Dielectric Barrier Discharge (DBD) Excimer Ultra- Violet (UV) lamps are a promising technology offering several advantages over other sources of UV light. In particular, the application of this type of lamps for drinking water treatment could benefit thousands of people in regions where public access to drinking water is not provided. To optimize the performance of the DBD Excimer UV lamps, a novel power system, intended for the study of this technology has been designed and implemented. This system employs a customized high frequency-high voltage current mode supply that allows adjusting the point of operation and the power injected in DBD lamps precisely. Using this innovative equipment, the operating conditions that optimize the uv output of the DBD Excilamps have been found. Based on the results of these studies, an innovative converter featuring high efficiency, zero current switching, and enhanced to work at an optimum operating point of the lamp was conceived and validated. The analytical development of the converters is described in detail providing useful equations applicable for pulsed power supplies for all types of DBD reactors. The discoveries of this research show that it is possible to increase the performance of DBD Excilamps based on the operating conditions of the power supply and also to obtain high electrical efficiency in the complete system.

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These results are crucial contributions to overcome technical, performance and implementation barriers, which have been obstacles to the transfer of this promising technology to the industry.



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