

Matching a nanosecond pulse generator to a corona plasma reactor

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MATCHING A (SUB) NANOSECOND PULSE SOURCE TO A COAXIAL STREAMER PLASMA REACTOR

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Matching a pulse source to a plasma reactor is a fundamental process to investigate in order to fully utilize the potential of pulsed power streamer discharges for air purification applications. This energy matching becomes even more challenging when the applied pulses have a subnanosecond rise time because the transmission-line effects of the plasma reactor become an important factor.

In this contribution we investigate the matching of a subnanosecond rise time, variable pulse duration, high-voltage, nanosecond pulse source¹ to a coaxial streamer plasma reactor. We varied pulse source parameters, plasma reactor parameters and process parameters to identify the best possible matching settings and elaborate on the mechanisms behind the different matching results. Furthermore, we introduce a novel multiple-wire inner conductor for the plasma reactor which results in a very good matching of the pulse source to the plasma reactor.

1. T. Huiskamp, E. J. M. van Heesch and A. J. M. Pemen, "Final Implementation of a Subnanosecond Rise Time, Variable Pulse Duration, Variable Amplitude, Repetitive, High-Voltage Pulse Source", *Plasma Science, IEEE Transactions on*, vol. 43, no. 1, pp. 444-451, 2015.