

Abstract Submitted
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Particle-in-Cell simulations of filamentary structures formation in DBD-tissue interaction ALEXANDRE LIKHANSKII, PETER MESSMER, Tech-X Corporation — Recent studies demonstrated high potential of the dielectric barrier discharge (DBD) plasmas for medical applications, such as sterilization or tissue regeneration. Despite intensive experimental studies have been conducted, the mechanism of plasma-tissue interaction still remains unclear. One of the open questions for the plasma-medical applications is the mechanism of filamentary structures formation in plasma and their interaction with tissues. Since formation of filaments is a purely kinetic effect, this issue needs to be addressed using kinetic, Particle-In-Cell simulation approach. We will present results of such numerical study. We performed 2D simulations of multiple streamers generation in atmospheric air using Tech-X's 2D/3D hybrid simulation tool VORPAL. We will demonstrate the resolution of the filamentary structure and will report the plasma properties. We will also address the plasma-induced effects on the tissue.

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