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Excitation of $N_2(C3\Pi_{u,v})$ and $N_2+(B2\Sigma_{u+,v})$ vibronic levels by streamer discharge in atmospheric pressure air¹ TOMAS HODER, Masaryk University, DPE, Brno, Czech Republic, MILAN SIMEK, Czech Academy of Sciences, IPP, Prague, Czech Republic, ZDENEK BONAVENTURA, Masaryk University, DPE, Brno, Czech Republic — Ionizing waves in air often take the form of thin filaments called streamers. Propagating streamer head is a place where the major part of reactive species is produced and that is of considerable interest for various applications, such as pollution control, ozone formation, etc. Knowledge of vibrational distributions of $N_2(C3\Pi_{u,v})$ and $N_2+(B2\Sigma_{u+,v})$ electronic states induced by the streamer head electrons is of particular interest, namely for determination of the self-enhanced electric field in the nitrogen/air streamer discharge. Indeed, vibrational distributions of $N_2(C3\Pi_{u,v})$ and $N_2+(B2\Sigma_{u+,v})$ states are very sensitive to the electric field variations occurring due to the streamer head action and might be used as a complementary spectrometric tool for monitoring streamer head parameters. In this work, a numerical study on streamer induced excitation of $N_2(C3\Pi_{u,v=0-4})$ and $N_2+(B2\Sigma_{u+,v=0-4})$ vibronic levels in air is presented and discussed from the point of view of improved determination of the streamer head parameters.

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