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# Investigating heating dynamics in sparks

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After the first streamer discharge front in a spark, heating and gas expansion sets in.This effect underlies the streamer to leader transition in air, and becomes strongerwith increasing density of the medium. We model and solve heat generation by the discharge,the thermal shock and the induced pressure wave. In particular, we investigate the electric breakdown of supercritical nitrogen and the subsequent recovery of insulation, motivated by a possible applicationas a high voltage switch.