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Investigation of breakdown processes in automotive HID lamps¹ ANDRE BERGNER, THOMAS HOEBING, CORNELIA RUHRMANN, JUER-GEN MENTEL, PETER AWAKOWICZ, Ruhr University Bochum — HID lamps are used for applications where high lumen output levels are required. Car headlights are a special field of HID lamp application. For security reasons and lawful regulations these lamps have to have a fast run-up phase and the possibility of hot re-strike. Therefore the background gas pressure amounts to 1.5 MPa xenon. But this high background gas pressure has the disadvantage that the ignition voltage becomes quite high due to Paschen's law. For that reason this paper deals with the investigation of the breakdown process of HID lamps for automotive application. The ignition is investigated by electrical as well as optical methods. Ignition voltage and current are measured on a nanosecond time scale and correlated with simultaneous phase resolved high speed photography done by an ICCD camera. So the ignition process can be observed from the first light emission until to the formation of whole discharge channel.

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